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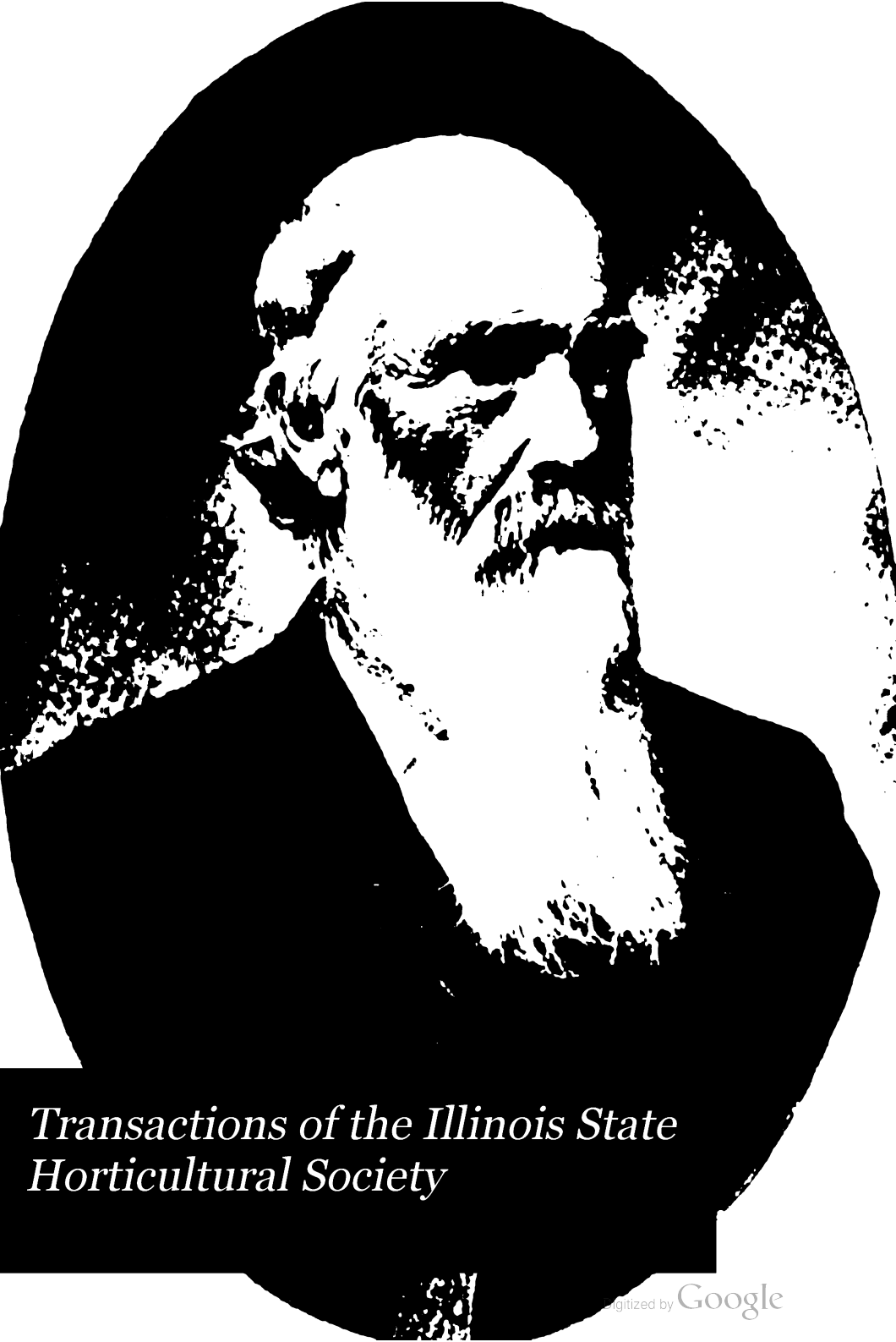

Transactions of the Illinois State Horticultural Society

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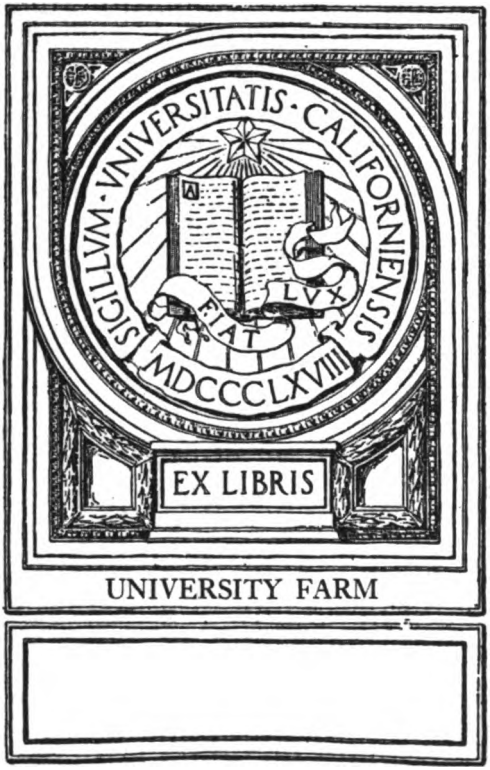

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A.V. STUBENRAUCH

SB21
I6
1907

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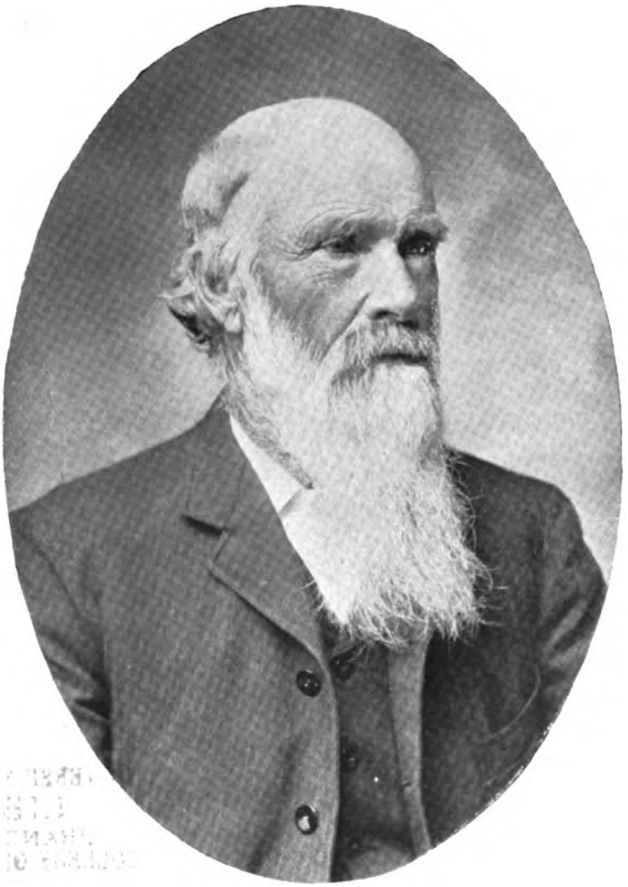

ARTHUR BRYANT

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TRANSACTIONS

OF THE

Illinois State Horticultural Society

FOR THE YEAR 1907

BEING THE PROCEEDINGS OF THE

FIFTY-SECOND ANNUAL MEETING

HELD AT

CHAMPAIGN, DECEMBER 11, 12 and 13, 1907

ALSO PROCEEDINGS OF THE

Northern, Central and Southern District Societies

AND A NUMBER OF COUNTY SOCIETIES
FOR THE YEAR 1907

NEW SERIES. VOLUME XLI.

EDITED BY THE SECRETARY, W. B. LLOYD, KINMUNDY, ILL.
PUBLISHED BY THE SOCIETY.

SPRINGFIELD, ILL.:
THE H. W. ROKKER CO., PRINTERS AND BINDERS
1907

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LIFE MEMBERSHIP.

The payment of five dollars at any one time will constitute a person a life member of the Illinois State Horticultural Society.

Any one becoming a life member now will receive twelve back reports of the Society.

In addition to the back reports one will, by becoming a life member, receive all the future reports and publications of the Society during his life time.

Every person interested in horticulture should become a life member of the State Horticultural Society; by so doing he benefits himself and strengthens the Society.

If interested send your name to the Secretary with five dollars and the reports will be forwarded to you by freight or express, as desired.

When sending your remittance please state your business occupation and postoffice address.

ANNUAL MEMBERSHIP.

One dollar will secure an annual membership and a copy of the 1907 report, free by mail. Members attending the annual meetings receive two copies if a request is made of the Secretary, and extra postage is sent.

FARMERS' COUNTY INSTITUTES.

The attention of the officers of farmers' county institutes is called to the fact that the Secretary will send, on receipt of application from the officers of such institutes, copies of this report for free distribution among the members thereof. The only expense will be the freight.

Copies of this report will be furnished ,on application, to the public school and other libraries of the State, and to local horticultural societies. Applicants will be expected to pay express charges or send stamps to cover postage.

Address W. B. LLOYD, *Secretary,*
Kinmundy, Ill.

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OFFICERS FOR 1908.

PRESIDENT.....R. O. GRAHAM, Bloomington
VICE PRESIDENT.....J. MACK TANNER, Chicago
SECRETARY.....W. B. LLOYD, Kinmundy
TREASURER.....J. W. STANTON, Richview

EXECUTIVE BOARD.

R. O. GRAHAM, PRESIDENT STATE SOCIETY.....Bloomington
W. B. LLOYD, SECRETARY STATE SOCIETY.....Kinmundy
W. R. SOVERHILL, PRESIDENT NORTHERN SOCIETY.....Tiskilwa
GUY A. BRYANT, VICE PRESIDENT NORTHERN SOCIETY..Princeton
H. AUGUSTINE, PRESIDENT CENTRAL SOCIETY.....Normal
JESSE PICKREL, VICE PRESIDENT CENTRAL SOCIETY...Knoxville
A. V. SCHERMERHORN, PRES. SOUTHERN SOCIETY..Kinmundy
J. C. B. HEATON, VICE PRES. SOUTHERN SOCIETY..New Burnside

DIRECTORS OF EXPERIMENT STATIONS.

Northern.....W. R. Soverhill, Tiskilwa
Central .....H. Augustine, Normal
Southern.....L. F. Dintelmann, Belleville

Some of the stations are for testing all kinds of fruit; others are limited in their experiments. Parties having valuable varieties of fruit which they wish to have tested should communicate with one of the directors who have charge of the work of the stations.

HORTICULTURAL EXPERIMENT STATIONS.

Location.	Superintendent of Station.
NORTHERN DISTRICT—	1. Princeton—all fruits.
	16. Dixon—Small fruits..J. L. HARTWELL
	18. Hebron—Small fruits, apples and plums.....H. G. STREET
CENTRAL DISTRICT—	4. Savoy—All fruits.....H. M. DUNLAP
	17. Scottsburg—All fruits..O. M. MCELVAIN
SOUTHERN DISTRICT—	8. North Alton—Small fruits..... .....EDWIN H. RIEHL
	8b. Alton—All fruits.....E. A. RIEHL
	11. Olney—Tree fruits.....J. F. JOLLY
	15. Villa Ridge—Grapes.....

16369

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To Hon. Charles Deneen, Governor of Illinois:

SIR:—I have the honor to transmit to your excellency, Volume 41 of the Transactions of the Illinois State Horticultural Society, containing, besides much other matter, the proceedings of the Society at its Fifty-second annual meeting. I trust that an inspection of this report will satisfy you that the funds appropriated to the Society by the General Assembly are being wisely expended for the best interests of Horticulture throughout the State.

Respectfully submitted,

W. B. LLOYD, *Secretary,*

Kinmundy, Ill.

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CONSTITUTON AND BY-LAWS.

AS AMENDED AT THE ANNUAL MEETINGS, 1874 AND 1895.

Constitution.

I. This Association shall be known as the ILLINOIS STATE HORTICULTURAL SOCIETY.

II. Its objects shall be the advancement of the Science of Pomology and the Art of Horticulture.

III. Its members shall consist of Annual Members, paying an annual fee of one dollar; of Life Members, paying a fee of five dollars at one time, and of Honorary Members, who shall only be persons of distinguished merit in Horticulture or kindred sciences, who may, by vote, be invited to participate in the privileges of the Society. The wives of members shall be members without fee.

IV. Its officers shall consist of a President, one Vice President, Secretary and Treasurer, who shall be elected at the annual meeting and serve until their successors are chosen; also an Executive Board, as hereinafter provided.

V. The affairs of the Society shall be managed by an Executive Board, to consist of the President and Secretary of the Society, and the President and Vice President from each of the three District Horticultural Socities of the State.

VI. The Society shall hold annual meetings and publish its transactions annually, *provided* there are sufficient funds in the treasury to defray the expenses of publication.

VII. The Constitution may be amended at any regular meeting by a two-thirds vote of the members present.

By-Laws.

I. The President shall preside at all meetings of the Society, call the meetings of the Executive Board, and, under its direction, have a general superintendence of the affairs of the Society and direction and expenditures of money. He shall deliver an annual address upon some subject connected with Horticulture, and shall appoint all special committees, unless otherwise ordered.

II. The Vice President shall preside at the meetings in the absence of the President.

III. The Secretary shall, upon the direction of the Executive Board, conduct the correspondence of the Society, have charge of its books, papers and reports, and prepare its reports for publication, and shall receive for his necessary expenses for postage, stationery, printing, expressage, office rent and salary, such sum as the Executive Board may vote therefor.

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IV. The Treasurer shall receive and keep an accurate account of all moneys belonging to the Society, and disburse the same upon the written orders of the President, which he shall retain and file as vouchers; he shall make an annual report to the Society of the receipts and disbursements, which, with the vouchers, shall be referred to a special auditing committee appointed at the annual meeting. Before entering upon his duties he shall give bond to the Society in the sum of ten thousand dollars for the faithful performance of his duties, such bond to be approved by the Executive Board.

V. The Executive Board shall perform all the duties required of them by Section 4 of the "Act Reorganizing the State Horticultural Society," approved March 24, 1874. They may appoint such standing and other committees as they may deem advisable.

VI. These By-Laws may be altered at any regular meeting by a two-thirds vote of the members present.

AN ACT TO REORGANIZE THE STATE HORTICULTURAL SOCIETY.

Be it Enacted by the People of the State of Illinois, represented in the General Assembly:

SECTION 1. That the organization heretofore chartered and aided by appropriations, under the name of the Illinois Horticultural Society, is hereby made and declared a public corporation of the State.

SEC. 2. The Illinois State Horticultural Society shall embrace, as hereinafter provided, three Horticultural Societies, to be organized in the three horticultural districts of the State, which shall be known as the Horticultural Society of Northern Illinois, now operating in the Counties of Bureau, Boone, Cook, Carroll, DuPage, DeKalb, Henry, Grundy, Jo Daviess, Kane, Kendall, Kankakee, Lake, Lee, LaSalle, McHenry, Ogle, Putnam, Rock Island, Stephenson, Whiteside, Winnebago and Will (23); the Horticultural Society of Central Illinois, operating in the Counties of Adams, Brown, Cass, Champaign, Christian, Coles, DeWitt, Douglas, Edgar, Fulton, Ford, Iroquois, Hancock, Henderson, Knox, Logan, Livingston, McLean, McDonough, Marshall, Mason, Mercer, Menard, Morgan, Macon, Moultrie, Peoria, Pike, Piatt, Sangamon, Shelby, Schuyler, Scott, Stark, Tazewell, Vermilion, Warren and Woodford (38); and the Horticultural Society of Southern Illinois, operating in the Counties of Alexander, Bond, Clark, Clay, Crawford, Calhoun, Cumberland, Clinton, Edwards, Effingham, Fayette, Franklin, Green, Gallatin, Hamilton, Hardin, Jasper, Jefferson, Jersey, Jackson, Johnson, Lawrence, Madison, Macoupin, Marion, Monroe, Montgomery, Massac, Perry, Pope, Pulaski, Richland, Randolph, St. Clair, Saline, Union, Wayne, White, Washington, Williamson and Wabash (41).

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SEC. 3. The affairs of the Illinois State Horticultural Society shall be managed by an Executive Board, to consist of the President and Secretary of said Society, and the President and one Vice President from each of the three District Horticultural Societies; *provided,* that the eligible officers now elect of the Illinois State and District Horticultural Societies shall be the first members of the Executive Board created by this act, and shall hold their offices until their successors are elected, as hereinafter provided.

SEC. 4. The Executive Board of the Illinois State Horticultural Society shall have the sole care and disposal of all funds that may be apportioned (appropriated) by the State of Illinois to sustain the Illinois State Horticultural Society, and shall expend the same in such manner as in their judgment will best promote the interests of Horticulture and Aboriculture in this State. They shall meet at Springfield on the second Tuesday after the first Monday in January, 1875, and biennially thereafter. They shall render to the Governor of the State a detailed statement of all funds received from the State, and all other sources, which statement shall also include all the expenditures made by them, and the specific objects in detail, for which said sums were expended. They shall make no appropriation without having funds in hand to meet the same, and if any debt is created the members of the Board shall be held severally and jointly liable for the payment of the same, and in no event shall the State of Illinois be held liable or responsible for any debt, obligation or contract made by the Illinois State Horticultural Society or its Executive Board.

SEC. 5. The Illinois State and the three District Horticultural Societies shall hold annual meetings, at which their officers for the ensuing year shall be elected. Within one month after the annual meeting of the District Societies they shall forward to the Secretary of the Executive Board a report of their transactions, including a list of the officers elected at such meeting. The Executive Board shall publish annually, at the expense of said Society, a report of its transactions and such other papers as they may deem of value to Horticulture and Aboriculture. Four members of the Executive Board shall constitute a quorum for the transaction of business.

SEC. 6. Members of the several District Societies shall be entitled to all the privileges of the members of the State Society, except that of voting for officers.

SEC. 7. By-laws and rules that do not conflict with the laws of this State may be passed and enforced by the several Societies herein mentioned.

Approved March 24, 1874.

*This Society was first incorporated Feb. 11, 1857—two months after its organization.

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LIST OF MEMBERS.

HONORARY MEMBERS.

Graves, J. B.—Strawberry Grower ..... Neosho, Mo.
Gebhardt, Benton—Apple Grower ..... Hart, Mich.
Palmer, L. H.—Apple Grower ..... Baraboo, Wis.
Spencer, F. P.—Fruit Grower ..... Randolph, Iowa

LIFE MEMBERS.

Albers, F. H.		Deputy Circuit Clerk	Carlyle
Aldrich, H. A.		Fruit Grower	Neoga
Alkire, A. D.		Farmer and Fruit Grower	Sweetwater
Alkire, T. H.		Farmer	Sweetwater
Alsbrook, A. W.	1905	Orchardist	New Burnside
Anicker, Peter	1902	Orchardist and Banker	126 N. Garfield Av., Peoria
Anschick, Conrad		Fruit and Vegetable Grower	Ottawa
Archer, A. S.			Pittsfield
Augustine, Archie M.	1893	Nurseryman	St. Helen, Mich.
Augustine, H.	1875	Nurseryman	Normal
Bacus, Wm. H.		Fruit Grower	R. R. No. 1, Nebo
Baker, J. W.		Traveling Salesman	Gladstone
Baxter, Emil J.	1901	Fruits and Wine	Nauvoo
Beal, A. C.	1902	University of Illinois	Urbana
Beal, L. N.	1885	Fruit Grower	Mt. Vernon
*Beauman, Harry	1903	Fruit Grower	Tunnell Hill
Beckmeyer, C. L.	1899		Upper Alton
Bemis, F. P.	1903	Insurance	Davenport, Iowa
Benedict, B. C.	1905	Nurseryman and Fruit Grower	Kampsville
Bennett, Dayton	1900	Farmer	Winfield, Kans.
Besly, Chas. H.	1901	Farmer	399 Ontario St., Chicago
Birks, J. W.	1904	Orchardist	R. R. No. 6, Olney
Black, S. N.		Farmer and Fruit Grower	Clayton
Blair, Prof. J. C.	1899	University of Illinois	Urbana

*Deceased.

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Boneham, R. E....1901..... Decatur
Boothby, Walter ..... Pittsfield
Bower, Ernest Z....1904..Orchardist and Horse Breeder.....Olney
Bowman, S. H.....1903..Banker .....Jerseyville
Brasfield, T. H.....Farmer .....Sweetwater
Braucher, H. H..... Lincoln
Braucher, R. W....1898..Fruit Storage .....Neoga
Brayton, A. W.....1900..Druggist and Chemist .....Mt. Morris
Breuer, Arthur.....1901..Farmer and Stock Raiser.....Somonauk
Brown, G. A..... Ashton
Brown, Lewis E....1898..Breeder of Fine Stock.....Delavan
Brown, W. H.....Farmer .....Canton
Bryant, A. W.....1905..Orchardist ..... Princeton
Bryant, G. A.....Nurseryman ..... Princeton
Bryant, H. G.....Nurseryman .....Davenport, Iowa
Bryant, L. R.....Orchard Fruits, Cider and Vinegar..Princeton
Buck, F. M.....1900.....6627 Harvard Ave., Chicago
Buckman, Benjamin.....Fruit Grower .....Farmingdale
Burrill, T. J.....1870..Dean of Horticulture, University of Illinois
..... Urbana
Burry, George.....1907..Lawyer .....Park Ridge
Butt, C. N.....1903..Fruit Grower .....Knoxville
Callaway, L. H....1901..Fruit Grower .....Chapin
Campbell, Col. J. R..1902..Fruit Grower .....McLeansboro
Carlin, W. E.....1900..Fruit Grower .....Jerseyville
Carr, E. R..... Ellisville
Churchill, F. L.....1901..Grain and Feed .....Fairbury
Coe, Wilbur F.....1907..Fruit Grower.....R. F. D. No. 4, Quincy
Coleman William .....Farmer and Fruit Grower.....Camp Point
Cooper Jr., S. P....1907..Orchardist ..... Richview
Cox, Asher R.....1902..Fruit Grower .....Xenia
Craig, Prof. John...1902..Cornell University .....Ithaca, N. Y.
Crandall, Prof. C. S.1902..University of Illinois.....Urbana
Crosby, J. N.....Fruits and Asparagus .....Wichert
Cupp, Henry C.....1901..Apple Grower .....Fall Creek
Dale, Robt. M.....1906..Small Fruits .....Normal
Darby, Dr. A. P....1901..Fruit Grower .....Ramsey
Davidson, C. M.....1901..Apple Dealer ...112 E. Front St., Cincinnati, O.
Denney, H. F.....1898..Farmer and Fruit Grower.....Augusta
Dintelmann, L. F...1902..Fruit Grower .....Belleville
Dodge, John R.....1901..... Normal
Draper, A. N.....1899..Fruit Grower .....Upper Alton
Drayton, C. O.....1901..... Trenton
Duncan, Prof. F. N.1903.....(Care L. C. Duncan), Flat Rock
Duff, Wm. H.....1904.....97 Grove St., River Forest

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Dunigan, A. J.....1904..Farmer .....1155 N. Third St., Springfield
Dunlap, A. J.....1900..Fruit Grower and Dairy.....Olney
Dunlap, Henry M.....Orchard Fruits, Cider and Vinegar.....Savoy
Dyer, Edith B.....1902..Fruit Grower .....Springfield
Eames, Dwight B...1901.....622 W. State St., Jacksonville
Eastman, John N...1900..Merchant, Farmer and Fruit Grower...Grafton
Emerick, David.....Fruit Grower .....Paris
Emerick, G. W.....1905..Orchardist ..... Sumner
Emrich, W. S..... Casey
Evans, Thomas S...1903 ..... Hillsboro
Farrand, J. A.....Farmer and Banker .....Griggsville
Felmley, John S.....Asst. Cashier Bank.....Griggsville
Ferrell, Caesar .....1906.....Box 226, Carterville
Field, Floyd C.....1906..Orchardist ..... Albion
Foster, C. J.....1899..Dealer in Pictures and Fruit Grower...Sumner
Foster, Geo. J.....Nurseryman ..... Normal
Francis, C. H.....1901..Orchardist and Farmer .....Altamont
Garber, Valentine F.1901..Farmer and Fruit Grower.....Lowpoint
Gardner, Harry ....1902..Fruit Grower .....Sullivan
George, Ira R..... Ashton
Gilbert, W. H.....Farmer .....Bright, Wis.
Gochanour, E. L....1902..Farmer .....Grand View, Ia.
Goodrich, T. E.....1904..Fruit Grower .....Cobden
Graham, R. O.....1903..Chemist, Manager Lilly Orchard Co. Blooming'n
Graves, J. B. .....1907..Fruit Grower .....Neosho, Mo.
Gravina, F. E.....1901..... Fairbury
Gretton, F. T.....1902..Fruit Grower.....2849 Sarah St., Pittsburg, Pa.
Griesemer, J. W...1899..Nurseryman ..... Hopedale
Grimsley, W. R.....Farmer ..... Sweetwater
Grout, A. P.....1899..Breeder of Fine Stock .....Winchester
Gruendike, B. W....1901..... Tonti
Hale, R. H.....1906..General Merchandise .....Cottonwood
*Hall, Rev. Claiborne.....Farmer ..... Athens
Hamilton, J. M.....Farmer ..... Rantoul
Hanon, Jesse .....Fruit Grower .....Flora
Hartwell, J. L.....Small Fruit Grower .....Dixon
Havenhill, Mark ...1904..Farmer ..... Fox
Hays, Frank .....1902..Small Fruits and Vegetables.....Wyanet
Heaton, J. C. B....1902..Fruit Grower .....New Burnside
Heaton, J. W.....Fruit Grower .....New Burnside
Heinl, Frank J..... Jacksonville
Herff, B. von.....1903..German Kali Works.93-99 Nassau St., New York
Herman, D. W.....1898..... Parkland
Hill, D. .....Nurseryman ..... Dundee
Hinkley, A. A.....Fruit Grower .....DuBois

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Hollinrake, Geo. S.....Strawberry Plants and Fruits.....Keithsburg
Honey, J. W.....1900..Orchardist .....West Liberty
Howe, R. B.....1905..Student in Horticulture.....Urbana
Hubbard, Fred C...1900..Fruit Grower .....Urbana
Hubbard, L. G.....Fruit and Vegetable Grower.....Urbana
Huber, Edward .....Farmer and Fruit Grower.....Illinois City
Hughes, N. J.....1903..... Waverly
Hull, L. M.....1905..Law Reporter .....Cedar Rapids, Iowa
Hunt, Geo. .....1900..Nurseryman .....Port Byron
Humphrey, A. G....1899..Physician ..... Galesburg
Ingels, Irwin .....Nurseryman ..... LaFayette
Irish, H. C.....1900..Asst. Horti. Mo. Botanical Gdn..St. Louis, Mo.
Irwin, Leaton .....1900..Orchardist ..... Quincy
Jameson, Sumner L.1907..Farmer and Stockman.....Canton
Jeffery, J. H.....1901..... Piper City
Johnson, F. C.....1899..Cider and Vinegar .....Kishwaukee
*Johnson, James T.....Farmer and Fruit Grower.....Warsaw
Jolly, J. F.....1901..Fruit Grower .....Olney
Jordan, J. M.....1906..Orchardist ..... Savoy
Knecht, J. E.....Commission Merchant....S. Water St., Chicago
Keffer, Prof. C. A...1900..University of Tennessee.....Knoxville, Tenn.
Kluck, N. A.....1900..Orchardist ..... McConnell
Kraft, Edward ....1905..Orchardist ..... Neoga
Kriebel, Daniel S.....Fruit Grower .....Springfield
Lake, Geo. L..... Fancy Prairie
Lanter, August ....1899..Fruit Grower .....Belleville
LaRosh, S. D.....Fruit Grower .....Pekin
Lasbury, M. N..... Griggsville
Lamence, Wm. ....1898..... Hudson
Livett, Wm. .....1899.....Warsaw, Ind.
Lloyd, Prof. J. W...1899..University of Illinois .....Champaign
Lloyd, W. B.....1895..Manager Glenoak Fruit Farm.....Kinmundy
Long, R. H.....1905..Student in Horticulture.....Urbana
Loop, A. I.....1901..Fruit Grower.....North East, Pa.
Madison, S. C.....1907..Student U. of Ill....1002 California St. Urbana
Manners, Daniel W..1901..... Litchfield
Martin, H. S.....Orchardist and Lawyer .....Marion, Kan.
McCabe, Thos. F...1906..Fruit and Vegetable Agent.....New Burnside
McClay, A. L.....1901..Commission Merchant..... Chicago
McElvain, O. M.....1901..Fruit Grower and Stock.....Bushnell
McClure, G. W.....Fruit and Vegetable Grower....Jackson, Miss
McKelvey, Frank H.1906..... Sparta
Mendenhall, E. G...1901..Nurseryman ..... Kinmundy

*Deceased.

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Meyer, Geo. F.....1901..Merchant .....Des Plaines
Moore, Will F.....1906..... Christopher
Morrison, N. B.....1900..Farmer ..... Odin
Murphy, F. G.....1899..Farmer and Fruit Grower.....York
Newhall, Benj. ....1902..Fruits, Commission...131 S. Water St., Chicago
Nolan, E. C.....1901..Physician .....Mt. Pulaski
Norris, James .....Farmer .....Yates City
Nesbitt, Orla A....1901..Fruit Grower .....Catlin
Nye, F. J.....1903..Farmer .....Putnam
Ogleevee, C. S.....1905..Prof. of Biology .....Lincoln
Paisley, C. M.....1901..Farmer and Fruit Grower.....Mt. Vernon
Parker, A. M.....1902..Fruit Grower.....1117 W. Wood St., Decatur
Parker, J. P..... Maroa
Pennell, F. W.....Lawyer and Farmer.....Danville
Perkins, A. L.....1901..Fruit Grower.....R. F. D. 4, Quincy
Periam, Jonathan ..... Editor.....526 Englewood Ave., Chicago
Perrine, W. S.....1900..Orchardist ..... Centralia
Perry, Wm. .....1906..... Milton
Phoenix, F. S.....1902..Nurseryman...2819 Brady St., Davenport, Iowa
Philbrick, C. L....1905..Orchardist .....Baldwin, Georgia
Phillips, Henry .....County Judge .....Virginia
Pierce, Newton B...1902..Pathologist, Department of Agriculture....
.....Santa Ana, Cal.
Pierson, Oscar ....1906.....Timewell, Brown County
Piper, D. J.....1906..Small Fruits .....R. R. No. 1, Forreston
Pitt, A. F.....1902..Orchardist ..... Jerseyville
Poland, B. J.....Physician ..... Danville
Poindexter, James..1904..... Bloomington
Potts, Wm. A.....1907..Lawyer ..... Pekin
Prather, Spees N...1901..Farmer ..... Urbana
Prosser, E. M.....1899..Mechanical Draughtsman and Fruit Grower
..... Richview
Prunty, Robert S...1901.. ..... Grayville
Prusz, H. L.....1904..Fruit and Poultry Specialist.....Centralia
Raymond, John E..1906..Farmer ..... Sidney
Reasoner, Rev. J. R..... Urbana
Rector, J. F.....1905..... ..... Smithfield
Redden, L. .....Fruit Grower .....Villa Ridge
Redeker, Walter C..1906..Student, U. of Ill.....683 St. Charles St., Elgin
Rehm, George .....1903..Hardware....353-355 Blue Island Ave., Chicago
Reid, Wm. ..... Danville
Reynolds, Joshua .....Fruit Grower .....Odin
Ribble, G. W.....Farmer and Stock Raiser .....Hettick
Riehl, E. A.....Fruit Grower .....Alton
Riehl, Edwin H....1904..Fruit Grower .....North Alton

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Rittenhouse, E. F...1905..Farmer and Fruit Grower.....Griswold
Rike, L. A.....1901..... Leroy
Rippey, Rev. G. W...1899.. ..... Atwood
Robb, A. C.....1905..Fruit Grower .....Jerseyville
Robbins, Daniel E.....Farmer and Apiarist .....Payson
Roberts, Wm. .....1905..Orchardist.....Harcourt, Victoria, Australia
Rudd, W. N.....1907..Supt. Mt. Greenwood Cemetery..Mt. Greenwood
Russell, J. B.....1906..Supt. of Schools.....Wheaton
Sanford, W. H.....1900..... Murrayville
Saxenmeyer, Theo..1901..Banker .....Red Bud
Schatteman, Henry.1900..Nursery and Fruit.....Atkinson
Schermerhorn, A. V.....Fruit Grower .....Kinmundy
Schulte, W. H.....1900..Banker ..... Hopedale
Sconce, H. J.....1906..Seed Corn, Short-Horn Cattle.....Sidell
Scott, John A. L...1901..Orchardist ..... Orchardville
Shadwell, Geo. W...1902.. ..... Flora
Shank, Daniel .....Nurseryman ..... Clayton
Shaw, Fred .....Summer Hill
Shaw, Ray .....Summer Hill
Shiner, Wm. H.....1899..Gardener and Fruit Grower.....Hudson
Shinn, J. R.....1903..Orchardist ..... Mattoon
Simonds, O. C.....1900..Landscape Gardener .....Buena Ave., Chicago
Simpson, R. A.....1901..of H. M. Simpson & Sons.....Vincennes, Ind.
Singer, E. J.....Fruit Grower.....3800 N. Adams St., Peoria
Small, Len ..... Kankakee
Smith, D. W..... ..... Springfield
Smith, Rev. J. S. .1901..... Heyworth
Snedeker, I. D.....1900..Fruit Grower .....Jerseyville
Snyder, J. F.....Glidden, Carroll County, Iowa
Spaulding, Irving E.....Nurseryman ..... Spaulding
Spencer, D. C..... Vandalia
Spencer, L. S.....1900..... Tolono
Stansfield, David...1900..... Murrayville
Stanton, J. W.....Orchardist ..... Richview
Stark, W. P.....1898..Secretary Stark Nursery Co.....Louisiana, Mo.
Stephens, E. F.....1903..Nurseryman ..... Crete, Neb.
Stenson, R. B.....Fruit Grower ..... Anna
Stinson, Prof. John T..... Springfield, Mo.
Stokes, L. E.....1902..Fruit Grower ..... Ramsey
Stone, James A.....Farmer and Apiarist.Rural Route 4, Springfield
Storer, G. B.....1900..Cold Storage .....Champaign
Staubitz, F. H.....1904..Lead and Zinc Mining.....Golconda
Swift, E. C.....Amateur Fruit Grower.....Ottawa
Tanner, J. Mack...1904..Fruit Grower .....Chicago
Taylor, Andrew M..1904..... Clinton

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Taylor, Rev. C. B...1904..Fruit Grower .....Urbana
Taylor, E. P.....1904. Field Entomologist .....Urbana
Temple, Charles....1905..Lawyer ..... Hardin
Thompson, D. F.....Farmer and Fruit Grower.....Kent
Tincher, J. W.....Farmer ..... Xenia
Ure, J. C.....Florist ..... Argyle Park, Chicago
VanHorn, A. K.....1900..Fruit Grower .....Jerseyville
Vaughan, J. C.....1901..Seedsman....84 and 86 Randolph St., Chicago
Voris, F. D.....Orchardist and Merchant .....Neoga
Wachtel, Fred C....1900..... Shumway
Walker, William L.....Fruit Grower .....St. Charles, Ark.
Walstrom, J. A.....Small Fruits .....Princeton
Warder, R. H.....1904..Sec'y Lincoln Park Commission, Clark & Center ..... Chicago
Warfield, B. C.....Small Fruit Grower .....Sandoval.
Warren, J. R.,F.R.S.1902..Orchardist.....Harcourt, Victoria, Australia
Watson, H. S.....1904..... Bloomington
Watts, M. F.....1900..Room 104, Union Station.....St. Louis, Mo.
Webster, C. H.....Fruit Grower ..... Centralia
Webster, Jabez ....1900..Horticulturist ..... Centralia
Weir, Wm. T.....Fruit Grower .....Gladstone
White, Wm. R.....1905..... Bloomington
Whitnell, C. W.....Fruit Grower and Nurseryman.....Peoria
Whitten, J. C.....1903..Professor of Horticulture, University of Missouri ..... Columbia, Mo.
Williams, F. L.....Nurseryman and Fruit Grower.....Tamaroa
Williams, John R.....Auditor, Waters-Pierce Oil Co...St. Louis, Mo.
Winkler, Joe H.....Attorney ..... Oakland
Winn, C. G.....Farmer and Orchardist .....Griggsville
Wirt, George .....Nurseryman .. ..Alpha
Wise, M. E.....Cerro Gordo
Wookey, Alonzo....1904..Music Dealer.....211 S. Adams St., Peoria
Wright, E. M.....1903..... ....Anna

Life members will please advise the Secretary of any error in their names or any change in their address.

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ANNUAL MEMBERS.

Ashby, H. M.....Sherwin-Williams Co., Pullman.....Chicago
Barrett, J. T.....1st Asst. in Botany, Agl. Ex. Station..Urbana
Bieble, H. L.....Fruit Grower .....Belleville
Blackmore, J. L.....Fruit Grower .....Paxton
Blanchard, O. A.....R. R. No. 4, Toulon
*Bryant, Arthur .....Nurseryman .. ..Princeton
Emerson, J. B.....Physician.....20 E. 30th St. New York City
Gage, J. A.....Nurseryman and Fruit.....Texico
Gallagher, E. .....Fruit Grower .....Stewardson
Gaston, A. H.....Horticulturist ....Harvey
Gebhardt, Benton .....Orchardist .....Hart, Mich
Hillier, B. F..... .....St. Charles
Jinnette, E. R.....Small Fruits and Vegetables.....Anna
Lutener, Edward .....Orchardist ....Liberty
Mattaz, A. C.....Orchardist ....Hardin
Millard, Geo. P.....Fruit Grower.....212 Flora Avenue, Peoria
Perrine, Chas. J.....Orchardist ....Centralia
*Sanders, Edgar .....Florist.....1639 Belmont Avenue, Chicago
Seibold, W. H..... ....Peoria
Soverhill, W. R.....Orchardist ....Tiskilwa
Stennett, W. H.....M. D.....303 Linden Avenue, Oak Park
Stevens, E. A.....Fruit Grower .....Centralia
The New Way Motor Co..Spray Pumps.....Lansing, Mich.
Walls, John W..... ....Watson
Winters, George .....Nurseryman and Fruit Grower.....LaSalle
Wyman, A. P..... ....Chicago
Wright, Grove .....Horticultrist .....Rock Falls

*Deceased.

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DIRECTIONS FOR MAKING SPRAY MIXTURES.

BY

THE DEPARTMENT OF HORTICULTURE, UNIVERSITY OF ILLINOIS, JANUARY, 1908.

Spray mixtures for the control of insect and fungous pests of plants are of three principal classes: Insecticides, fungicides, and combined insecticides and fungicides. The names of these classes indicate the reasons for this classification. Insecticides are designed to combat insect pests alone. Fungicides are intended to control fungous diseases alone. Combined insecticides and fungicides are mixtures containing remedies for both insects and plant diseases applied in a common medium, generally water.

INSECTICIDES.

Paris Green:

4 ounces Paris green.
½ pound lime.
50 gallons water.

Slake the lime carefully in a small quantity of water. When completely slaked add sufficient water to make a milky paste. Pour this through a fine strainer into the spray barrel or tank containing water sufficient to make fifty gallons. Mix the four ounces of Paris green with a small quantity of water and pour into the lime and water mixture through a strainer. The Paris green may be more readily and thoroughly mixed with the water if the two be placed in a bottle or jug and violently shaken for a few seconds before being added to the liquid in the spray tank. Thorough and constant agitation of the mixture during its application is necessary, as Paris green settles to the bottom of the tank in a few minutes if the preparation is left standing.

Paris green is frequently used without the addition of lime. In many cases, however, free arsenious acid, a very dangerous plant poison, is found in Paris green, and the addition of lime as a neutralizing agent is advised.

Paris green is to be used against all chewing insects—codling moth, canker worm, curculio, currant worm, leaf skeletonizer, tent caterpillars, fall web-worm, grasshoppers, and Colorado potato beetle. For the latter insect eight ounces of the poison are commonly used instead of four ounces as given in the formula above.

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Arsenate of Lead:

Commercial—2 to 3 pounds arsenate of lead or disparene.
50 gallons water.

Home-made—10 ounces arsenate of soda.
25 ounces acetate of lead.
50 gallons water.

Commercial arsenate of lead is prepared for spraying simply by thorough mixing with water in the quantity required. Homemade arsenate of lead is, however, more difficult of preparation. Dissolve separately in one gallon of water ten ounces of arsenate of soda, and in three gallons of water twenty-five ounces acetate of lead. Pour the two, one after the other, into a mixing tank, or directly into a spray tank containing forty-six gallons of water. Mix thoroughly and apply in the ordinary manner.

The two pound mixture of commercial arsenate of lead is used for most of the leaf-and fruit-eating insects mentioned under the heading, "Paris Green," but for curculio, second brood codling moth, and potato beetles, the three pound formula is more effective. The formula given for home-made arsenate of lead will be found satisfactory for practically all the chewing insects listed. Arsenate of lead is, however, a very safe poison to use, and if desirable, double the quantities recommended may be used to secure more rapid or more certain results without danger of injury to the foliage.

Arsenite of Lime:

1 pint arsenite of soda solution.
2 pounds fresh lime.
50 gallons water.

The arsenite of soda is prepared according to the formula:

2 pounds white arsenic.
8 pounds salsoda.
2 gallons water.

Boil together for fifteen minutes. This solution, which is a stock solution, should be put into an earthen jug, marked "poison," and kept locked up where there will be no danger of its being mistaken for anything else than a deadly poison.

When ready to spray, slake two pounds fresh lime in a small quantity of water; stir it into enough more water to make fifty gallons of spray mixture; and add one pint of arsenate of soda solution from the jug, taking care to shake the jug.

Arsenite of lime must be used with great caution. The directions given above must be followed exactly. The lime used must be fresh and good. Measurements and weights of materials used must be accurate. If these precautions are not taken the chemical union will be imperfect, soluble arsenic will be found in the spray mixture, and there will be great danger of burning the foliage.

Arsenite of lime is used against chewing insects.

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Kerosene Emulsion:

½ pound hard soap, or ½ pound whale oil soap, or 1 quart soft soap.
2 gallons kerosene.
1 gallon soft water.

Dissolve the soap in the water heated to boiling, *remove the water from the fire* and add the coal oil to the hot mixture, churning or stirring it violently at the same time. Pumping the mixture back upon itself through a hand force pump is an excellent method of making the emulsion. Continue the stirring or pumping until a creamy combination is obtained which shows no free oil on its surface. This is a concentrated solution and must not be used on plants until further diluted as directed below.

For application to apple and pear trees in foliage for green apple aphis, wooly aphis, pear tree psylla, etc., dilute one gallon of the emulsion with nine gallons of water. For cherry, plum, and peach trees and plants with tender foliage dilute with twelve gallons of water. For house plants dilute with fifteen gallons of water. For scale insects dilute with five or six gallons of water and apply before leaves come out, or to trunks and branches only, later in the season

Kerosene emulsion is used against plant lice and soft bodied sucking insects generally. It is effective against green apple aphis, wooly aphis, pear tree psylla, cherry aphis, the young forms of many scale insects, such as oystershell bark louse, San Jose Scale, and scurvy bark louse, mealy bug, green aphids, and some of the soft bodied lecanium scales which commonly trouble house plants.

Whale Oil Soap:

For applications to foliage—1 pound whale oil soap.
8 gallons water.
For application to dormant trees—2 pounds whale oil soap.
1 gallon water.

Whale oil soap is purchased ready for use and the spray mixture is prepared by dissolving the soap in boiling water and diluting to the strength required.

Whale oil soap is used against the various soft-bodied suckling insects mentioned under the heading, "Kerosene Emulsion." It is also sometimes applied in strong solution to dormant trees to destroy San Jose Scale, and the eggs of various insects which remain on trees over winter. The disagreeable odor of whale oil soap makes it unsuitable as a remedy for pests on house plants.

White Hellebore:

1 pound white hellebore.
50 gallons water.

Mix the hellebore with a small quantity of water and pour into a spray tank containing the required amount of water.

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White hellebore is used against insects in the kitchen garden, such as currant worms, cabbage worms, caterpillars, and other chewing insects attacking vegetable and small fruit crops. It may also be applied as a dry powder being dusted on the plants when the dew is on them early in the morning or late in the evening. White hellebore deteriorates in strength when exposed to the air and should be kept in air tight receptacles.

FUNGICIDES.

Bordeaux Mixture:

3 pounds copper sulphate.
4 pounds fresh lime.
50 gallons water.

To prepare fifty gallons of Bordeaux mixture dissolve the copper sulphate in twenty-five gallons of water. Mix the lime, carefully slaked, in a small quantity of water, with another twenty-five gallons of water. Then pour the two simultaneously through a strainer that will remove all lumps of lime, into a mixing tub, stirring thoroughly as the two solutions fall into the tub. Be absolutely certain that weights and measurements are correct.

When large quantities of Bordeaux mixture are to be prepared it is customary to make up stock solutions of copper sulphate and lime. Fifty pounds of copper sulphate are dissolved in fifty gallons of water, the sulphate being suspended in a coarse sack near the top of the barrel to hasten solution. Fifty pounds of lime are slaked and diluted with fifty gallons of water. When these solutions are stirred so that the copper sulphate and the lime are evenly distributed throughout, each gallon of the mixtures will represent one pound of sulphate or one pound of lime. Add four gallons of the copper sulphate solution, well stirred, to twenty-one gallons of water; and four gallons of the lime mixture *well stirred* to twenty-one gallons of water. Mix the dilute solutions as directed in the above paragraph.

Bordeaux mixture should be handled only in wooden receptacles and the pump with which it is applied should have brass parts throughout. It is unsafe to use mixture which has stood over night, and it is advised that only fresh Bordeaux be used at any time.

Bordeaux mixture prepared according to the formula given above is for general use on apples, pears, asparagus, grapes, tomatoes, and strawberries. It is designed to prevent or destroy apple scab, bitter rot of apples, various cankers and wood rots of orchard trees, brown rot, black rot, and mildews of the grape, tomato rust, rusts and leaf spot of strawberries, anthracnose of the raspberry, and many other fungus pests. Made with two pounds of copper sulphate and four pounds of lime, it is intended for use with peach, plum, and cherry trees, green house plants and tender seedlings, as a preventive of brown rot and mildews, damping off fungus, etc. Made with six pounds of copper sulphate and six pounds

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of lime it is used for spraying dormant trees as a means of destroying winter spores and preventing early infections of fungus diseases when growth starts in the spring.

Potassium Sulphide:

1¼ pounds potassium sulphide.

50 gallons water.

Dissolve the potassium sulphide in two or three gallons of hot water and then make up to fifty gallons with cold water.

Potassium sulphide is used to control mildews of various kinds and is particularly efficacious against gooseberry mildew.

COMBINED INSECTICIDES AND FUNGICIDES.

Paris green, arsenate of lead, and arsenite of lime are commonly applied in sprays along with Bordeaux mixture, thus combining the insecticidal value of the arsenical with the fungicidal value of the Bordeaux mixture.

Bordeaux-Paris Green:

4 ounces Paris green.

50 gallons Bordeaux mixture.

Mix four ounces of Paris green with a small quantity of water, shaking the two together in a bottle or jug. Pour the Paris green into the tub containing the dilute lime mixture and proceed to make the Bordeaux in the usual manner.

Bordeaux-Arsenate of Lead:

2 to 3 pounds of commercial arsenate of lead.

50 gallons Bordeaux mixture.

Or,

10 ounces arsenate of soda.

25 ounces acetate of lead.

50 gallons water.

Prepare the arsenate of lead as explained in the directions for making arsenate of lead mixture, in the water used to dilute the milk of lime. Then pour the lime and copper sulphate mixtures into the mixing tub in the manner described for the preparation of simple Bordeaux mixture.

If the arsenate of lead is prepared directly in the Bordeaux mixture an even distribution of the commercial arsenate cannot be obtained, and in the case of the homemade poison a complete chemical union between the arsenate of soda and the acetate of lead is impossible. Hence it is necessary to follow implicitly the instruction to prepare the arsenate of lead in the water used to dilute the milk of lime.

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Bordeaux-Arsenite of Lime:

1 pint arsenite of soda. { 2 pounds white arsenic. 8 pounds sal soda. 2 gallons water.

2 pounds lime.

50 gallons Bordeaux mixture.

Prepare the arsenite of lime, as explained in the directions for making arsenite of lime mixture, in the water to be used in diluting the milk of lime. Then pour the lime and copper sulphate mixtures simultaneously into the mixing tub, in the manner described for the preparation of simple Bordeaux mixture.

NOTE.—In the proceedings of the Central Society is paper dealing with standard spray mixtures. In this paper a more detailed account is given of the preparation of several of the mixtures referred to above.

DIRECTIONS FOR THE PREPARATION AND USE OF THE LIME AND SULPHER WASH.

BY S. A. FORBES, STATE ENTOMOLOGIST.

Materials—Fifteen pounds of lime, fifteen pounds of sulphur, and fifty gallons of water. For fifty gallons of the spray, heat twelve gallons of water in a forty-gallon iron kettle, mixing, in the meantime, in a separate vessel, fifteen pounds of sulphur with enough water to form a thin paste. Add this sulphur to the water in the kettle and bring the mixture to a temperature just below boiling. Then add fifteen pounds of best lump lime, keeping cold water at hand to use as the mixture threatens to boil over. After the lime is fully slaked, boil for sixty minutes, with almost constant stirring. Then strain into fifty-gallon spray tank and fill with water, which had better be warm, although cold water will do. To prepare one hundred gallons of the spray at a time, heat twenty gallons of water in the forty-gallon kettle, add thirty pounds of sulphur—previously reduced to a thin paste with water—and to this put thirty pounds of lime. Boil as before and dilute to one hundred gallons.

If a supply of steam is available for cooking the mixture, this will be found much the more convenient source of heat. The cooking is then done in barrels or other vessels from which the fluid is strained into the spray tank. The disturbance caused by the introduction of steam makes stirring unnecessary. When cooked with steam the mixture does not ordinarily become so dark as when boiled over a fire, but the insecticide effect is, nevertheless, the same.

Very large trees and those with a brushy top should be pruned before spraying, and thickets of plum, peach, and the like, along fences and beside roads, should be cut out and destroyed. It is better that all infested Osage orange hedges should be destroyed, as the scale breeds as

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freely on this plant as on any orchard tree, and it is difficult to spray such a hedge so thoroughly as to reach most of the scales. Trees so heavily infested as to be practically worthless should be dug up and burned, since it will not pay to spray them. Even though the scale insects may be killed, the effect of their injuries will usually be fatal to the tree.

Any premises which have once been infested by the San Jose scale must be carefully examined from time to time, especially late in fall, no matter how thoroughly and effectively they may have been treated; and whenever the scale becomes noticeably abundant the infested trees must again be sprayed, care being taken to extend the treatment far enough to include adjacent trees to which the insect may possibly have spread.

I need hardly emphasize the importance of common action by all the people of an infested district, since unless all act together an orchard virtually freed of the scale will gradually become re-infested from adjacent premises. It should be understood, however, that even under the most unfavorable circumstances each fruitgrower may protect himself by careful observation and methodical work.

Do not spray this mixture against paint, which may be blackened by the sulphur. It is a good plan to have horses used in spraying operations blanketed, as the dried mixture is hard to remove from the hair. Persons preparing or applying the spray should avoid getting it upon the bare hands or face, as it is very caustic. The undiluted mixture should not be left in the kettle over night, as it is likely to harden and cake, and is then worthless. See that all barrels and all apparatus are thoroughly cleansed before using the mixture in them, otherwise the nozzles are likely to clog. Thoroughly clean kettles, hose, barrels, pumps, nozzles, and all spraying apparatus when the work with the wash is over for the season.

Use this wash on the trees after the leaves are off, preferably late in the spring, before the buds have commenced to open. Never use the wash on trees in leaf. Thoroughly coat the trees, being careful to cover the smaller twigs and branches and to get the mixture in all the forks and crevices. Do not attempt to spray from one side only.

If a heavy rain or severe cold weather follows soon after spraying, the treatment must be repeated.

STANDARD FOR APPLE PACKAGES AND GRADES.

ADOPTED BY THE ILLINOIS STATE HORTICULTURAL SOCIETY, DEC. 17, 1903.

Resolved, That this Society adopt as a standard barrel for apples a barrel which is of the capacity of a flour barrel, which is 17⅛ inches in diameter at head, 28½ inches in length of stave and bulge not less than

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PREMIUM LIST.

The following premiums were offered for exhibits of horticultural products at the annual meeting of the Society:

CLASS I.

1	Best collection of apples, not less than 6 and not to exceed 15 varieties (3d Prem. $5.00)	$25 00	$10 00
2	Best collection of new apples, not to exceed 5 varieties	2 00	1 00
3	Best plate new apples, good enough to be recommended	2 00	1 00
4	Best plate seedling apples, good enough to be recommended	2 00	1 00
5	Best plate new pears, good enough to be recommended	2 00	1 00
6	Best plate new grapes, good enough to be recommended	2 00	1 00

CLASS II—NORTHERN ILLINOIS.

7	Best four varieties of winter apples for market	2 00	1 00
8	Best four varieties winter apples for family use	2 00	1 00
9	Best three varieties fall apples for market	2 00	1 00
10	Best three varieties fall apples for family use	2 00	1 00
11	Best single variety winter apples for market	1 50	75
12	Best single variety winter apples for family use	1 50	75
13	Best single variety fall apples for market	1 50	75
14	Best single variety fall apples for family use	1 50	75
15	Best plate Ben Davis	1 50	75
16	Best plate Willow Twig	1 50	75
17	Best plate Jonathan	1 50	75
18	Best plate Grimes Golden	1 50	75
19	Best plate Minkler	1 50	75
20	Best plate Salome	1 50	75
21	Best plate Roman Stem	1 50	75
22	Best plate Wealthy	1 50	75
23	Best plate Snow	1 50	75
24	Best plate Bailey Sweet	1 50	75
25	Best plate Northwestern Greening	1 50	75
26	Best plate Pewaukee	1 50	75
27	Best plate variety not named in above list	1 50	75

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CLASS III—CENTRAL ILLINOIS.

28	Best four varieties winter apples for market.....	2 00	1 00
29	Best four varieties winter apples for family use....	2 00	1 00
30	Best three varieties fall apples for market.....	2 00	1 00
31	Best three varieties fall apples for family use....	2 00	1 00
32	Best single variety winter apples for market.....	1 50	75
33	Best single variety winter apples for family use....	1 50	75
34	Best single variety fall apples for market.....	1 50	75
35	Best single variety fall apples for family use.....	1 50	75
36	Best plate Ben Davis.....	1 50	75
37	Best plate Willow Twig	1 50	75
38	Best plate Rome Beauty	1 50	75
39	Best plate Jonathan	1 50	75
40	Best plate Grimes Golden	1 50	75
41	Best plate Minkler	1 50	75
42	Best plate Winesap	1 50	75
43	Best plate Missouri Pippin	1 50	75
44	Best plate Sweet Apples.....	1 50	75
45	Best plate Rawles Janet	1 50	75
46	Best plate White Pippin.....	1 50	75
47	Best plate Stark	1 50	75
48	Best plate variety not named in above list.....	1 50	75

CLASS IV—SOUTHERN ILLINOIS.

49	Best four varieties winter apples for market.....	2 00	1 00
50	Best four varieties winter apples for family use....	2 00	1 00
51	Best three varieties fall apples for market.....	2 00	1 00
52	Best three varieties fall apples for family use.....	2 00	1 00
53	Best single variety winter apples for market.....	1 50	75
54	Best single variety winter apples for family use..	1 50	75
55	Best single variety fall apples for market.....	1 50	75
56	Best single variety fall apples for family use.....	1 50	75
57	Best plate Ben Davis	1 50	75
58	Best plate Willow Twig.....	1 50	75
59	Best plate Jonathan	1 50	75
60	Best plate Rome Beauty.....	1 50	75
61	Best plate Newton Pippin	1 50	75
62	Best plate Minkler	1 50	75
63	Best plate Akin	1 50	75
64	Best plate Grimes Golden.....	1 50	75
65	Best plate Winesap	1 50	75
66	Best plate Rawles Janet.....	1 50	75
67	Best plate Reinish May.....	1 50	75
68	Best plate Huntsman	1 50	75
69	Best plate variety not named in above list.....	1 50	75

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CLASS V—PEARS, GRAPES AND QUINCES.

70	Best collection of pears	3 00	2 00
71	Best plate Anjou	1 50	75
72	Best plate Duchess	1 50	75
73	Best plate Keiffer	1 50	75
74	Best plate pears, variety not named in above list	1 50	75
75	Best plate white grapes	2 00	1 00
76	Best plate black grapes	2 00	1 00
77	Best plate red grapes	2 00	1 00
78	Best collection of quinces	2 00	1 00
79	Best plate quinces	1 50	75
80	Best collection edible nuts grown in Illinois	3 00	2 00

CLASS VI—VEGETABLES.

81	Best half peck early potatoes	1 00	50
82	Best half peck potatoes for winter and spring	1 00	50
83	Best half peck onions from seed	1 00	50
84	Best half peck onions grown from sets	1 00	50
85	Best three heads celery	1 00	50
86	Best half peck sweet potatoes	1 00	50
87	Best half peck turnips	1 00	50
88	Best half peck beets	1 00	50
89	Best half peck parsnips	1 00	50
90	Best half peck carrots	1 00	50
91	Best winter squash	1 00	50
92	Best head cabbage	1 00	50
93	Best sample of salsify	1 00	50
94	Best sample of winter radish	1 00	50

CLASS VII—EXPERIMENT STATIONS.

		1st	2d	3d	4th
95	Most valuable collection from any of the Society's Experiment Stations	$12 00	$10 00	$8 00	$6 00

Speciments preserved in glass may be included in this class.

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RULES OF EXHIBITION.

I. All entries must be in the hands of the Secretary on or before 12 o'clock noon the first day of the meeting. The entry cards will be handed exhibitors on the first day of the meeting. Exhibitors must become members of the Society by payment of $1 membership fee on receiving their entry cards. When exhibitors do not attend meetings $1 must accompany application for entry; express charges on fruit must be prepaid.

II. All articles must be entered in the name of the grower, and a statement to that effect MUST accompany the application for entry.

III. All exhibits MUST be on the tables at 1 p. m., the first day of the meeting, properly arranged, and plainly and conspicuously labeled with the name of the fruit and place of growth, and accompanied by a list for the use of the awarding committee.

IV. All premiums shall be open to all, except those for the several districts, in which the exhibitor must reside within the district, and products of the Experiment Stations which will be allowed to compete only in Class VII.

V. "Plates" of fruit—except grapes—shall consist of four specimens—neither more nor less. The same variety may compete for different premiums, and different varieties for the same premium, but separate samples must be furnished for each entry, and a different variety or selection of varieties for each entry, where more than one entry is made for the same premium.

VI. All applications for entry of seedling and new fruits must be accompanied by a full statement of origin, habit of growth, hardiness and productiveness, or no entries will be made.

Competent committees will be appointed to make the awards, who will be governed by the following:

SPECIAL RULES:

1. Exhibits not worthy will not be awarded a premium, though there be no competition.

2. The condition and general appearance of the fruit—which should be in its natural state, with all its parts—stem and calyx segment—well preserved, not wilted, nor shriveled.

3. The size, in apples and pears particularly, should be average and neither overgrown nor small—the specimens should be even in size.

4. The form should be regular or normal to the variety, and the lot even.

5. The color and markings of the surface to be in character—not blotched nor scabby.

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6. When comparing different varieties, and even the same kind, grown on different soils, the texture and flavor are important elements in coming to a decision.

In grapes we must consider and compare the form and size of the bunches, the berries, their color, ripeness, flavor and condition.

7. Fruit that has been named and passed upon by a Horticultural Society shall no longer be considered a "seedling," and fruit that has been introduced and named ten years shall no longer be considered "new."

The following scale of points, adopted at the annual meeting of the Society in 1905, was expected to govern the judges in making the awards:

	No. of Points.
Quality	20
Form	15
Color	15
Size	10
Uniformity in size	20
Freedom from imperfections	20
Perfection	100

After the judges had been appointed for the various classes, they, with Mr. H. A. Aldrich as chairman, were made a committee to revise the score card and formulate rules for its use. Their report was adopted and the new score card, which appears on page 59, was used in judging the exhibits.

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LIST OF FRUITS

RECOMMENDED BY

The District Horticultural Societies

For the Territory Embraced in Their Districts.

FOR NORTHERN ILLINOIS.

APPLES—

Summer Varieties—Red Astrachan, Duchess, Yellow Transparent, Sweet Bough.

Fall Varieties—Wealthy, McMahon, Fameuse (Snow), Ramsdell *Sweet*, Dyer, McIntosh.

Early Winter—Jonathan, Grimes *Golden*, Domine, Wagener.

Late Winter—Minkler, Salome, Ben Davis, Willow, Tolman Sweet.

PEARS—

Standard—Flemish *Beauty* and Lincoln for early; Keiffer and Lawrence for late.

Dwarf—Howell for early; Duchess for late.

PEACHES—

Elberta, Champion, Alexander.

CHERRIES—

(Early) Richmond, Montmorency, English Morello.

PLUMS—

DeSoto, Wyant, Burbank, Pomona, Surprise.

BLACKBERRIES—

Snyder.

RASPBERRIES—

Red—King for prairie or rich soil, Cuthbert for clay or light soil.

Black—Kansas, Older, Gregg.

Purple—Columbian.

GRAPES—

White—Moore's Diamond, Niagara.

Red—Brighton, Woodruff.

Black—Concord, Worden, Moore's Early.

GOOSEBERRIES—

Downing, Chautauqua.

CURRANTS—

Victoria, White Grape, Pomona, Wilder.

STRAWBERRIES—

(Staminate) Splendid, Bederwood, Dunlap, (Pistillate) Warfield.

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FOR CENTRAL ILLINOIS.

APPLES—For family orchard:

Summer—Benoni, Sops of Wine, Early Harvest, Duchess, Golden Sweet, Keswick *Codlin.*

Fall—Maiden's Blush, Fameuse, Autumn Strawberry, Wealthy, Ramsdell *Sweet.*

Early Winter—Jonathan, Roman Stem, Grimes *Golden.*

Late Winter—Minkler, Ben Davis, Missouri Pippin, Willow, Rawles Janet, White Pippin.

APPLES—For commercial orchard of 1,000 trees:

Summer—25 Benoni, 50 Duchess, 25 Keswick *Codlin.*

Fall—25 Maiden Blush, 25 Fameuse, 40 Wealthy, 10 Ramsdell *Sweet.*

Early Winter—100 Grimes *Golden*, 100 Jonathan.

Late Winter—300 Ben Davis, 200 Willow, 100 Gano.

CRAB APPLES—

Hyslop, Transcendent.

STANDARD PEARS—For family use:

Tyson, Flemish *Beauty*, Sheldon, Seckel, Sudduth, Lincoln, Lawrence.

STANDARD PEARS—Market:

Keiffer, Howell, Duchess, Garber.

DWARF PEARS—

Duchess.

PLUMS—

DeSoto, Damson, Miner, Wild Goose, Wolf, Japan, Red June, Abundance, Burbank, Pottawattamie.

CHERRIES—

(Early) Richmond, (English) Morello, Montmorency, Dyehouse.

BLACKBERRIES—

Snyder, Early Harvest.

RASPBERRIES—

Red—Turner, Cuthbert.

Black—Gregg, Kansas, Older.

Purple—Columbian, Shaffer.

STRAWBERRIES—

Crescent, Warfield, Haverland, Dunlap, Splendid, Sample.

Late—Gandy, Brandywine.

GRAPES—

Moore's *Early*, [illegible]en, Pocklington, Woodruff *Red*, Concord, Niagara, Brighton.

GOOSEBERRIES—

Houghton, Downing.

CURRANTS—

Red Dutch, Fay's Prolific, White Grape.

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FOR SOUTHERN ILLINOIS.

NORTHERN SECTION.

APPLES—FOR FAMILY USE:

Summer—Early Harvest, Yellow Transparent, Benoni, Maiden's Blush, Sweet Bough, Wealthy.

Fall—Jonathan, Grimes Golden, Rome Beauty.

Winter—York Imperial, Gano, Ben Davis, Winesap, Stayman.

MARKET—

Summer—Yellow Transparent, Duchess, Benoni, Chenango Strawberry, Lowell, Wealthy.

Fall and *Winter*—Same as for family use.

FOR FAMILY— CENTRAL, OZARK HILL, SECTION.

Summer—Early Harvest, Yellow Transparent, Duchess, Benoni, Sweet Bough, Horse, Red June, Maiden's Blush, Sherwood's Favorite.

Fall—Jonathan, Grimes, Smith's Cider, Akin.

Winter—Winesap, Kinnard, Ben Davis, Reinish May, Domanite, Ingram, Stayman.

FOR MARKET—

Summer—Early Harvest, Yellow Transparent, Red June, Duchess, Benoni, Horse, Lowell, Sherwood's Favorite, Maiden's Blush, Sops of Wine.

Fall and *Winter*—Same as for family, except Romanite and Stayman.

SOUTHERN SECTION.

Early—Yellow Transparent, McMahon, Benoni, Duchess, Fanny, Red June.

Late—Maiden's Blush, Grimes, Jonathan, Rome Beauty, Winesap, Kinnard, Winter May, Ingram.

PEARS—Bartlett, Howell, Keiffer, Duchess, Seckel.

PEACHES—Mountain Rose, Ede, Elberta, Oldmixon, (Free and Cling) Reeve's Favorite, Heath Cling, Stump, Smock, Lemon Cling, Champion.

CHERRIES—(Early) Richmond, Montmorency, (English) Morello.

PLUMS—Wild Goose, Miner, Shipper's Pride, Shropshire Damson, Blue Damson, Abundance.

QUINCES—Rea (*Early*), Orange, (*Medium*), Meech (*Late*).

GRAPES—Worden, Niagara, Wilder, Ives, Concord, Salem, Moore's Early, Goethe.

BLACKBERRIES—Early Harvest, Snyder.

RASPBERRIES—

Red—Turner, Cuthbert, Miller.

Black—Gregg, Kansas, Cumberland.

GOOSEBERRIES—Houghton, Downing.

CURRANTS—Pomona, Cherry.

STRAWBERRIES—Excelsior, Tennessee Prolific, Dunlap, Klondike, Crescent, Bubach, Haverland, Warfield, Lovett, Aroma, Lady Thompson, Gandy.

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PROCEEDINGS

OF THE

FIFTY-SECOND ANNUAL CONVENTION

OF THE

Illinois State Horticultural Society

HELD IN

Morrow Hall, Agr cultural Building, University of Illinois, Champaign, Ill., December 11, 12 and 13, 1907.

WEDNESDAY—MORNING SESSION.

The convention was called to order at 10 o'clock, President Geo. J. Foster in the chair.

Rev. H. C. Gibbs, Urbana, opened the session with prayer.

TREASURER'S REPORT.

J. W. Stanton, Treasurer, in account with the Illinois State Horticultural Society.

RECEIPTS.

Dec. 11, 1906—To balance on hand	$ 661 10
Dec. 15, 1906—To State Appropriation in part	1,500 00
Jan. 7, 1907—To State Appropriation	1,000 00
Jan. 14, 1907—To amount refunded by J. R. Shinn	8 00
Feb. 14, 1907—To State Appropriation	1,000 00
May 22, 1907—To State Appropriation	750 00
July 23, 1907—To State Appropriation	750 00
Total receipts	$5,669 10

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EXPENDITURES IN DETAIL—GENERAL FUND.

Warrant No.		
A489	H. U. Bailey, printing	$ 28 75
A490	D. H. Dean, printing	6 25
A491	H. G. Street, delegate expenses to Wisconsin meeting	5 10
A492	C. G. Winn, delegate expenses to Southern Society	13 35
A493	L. R. Bryant, postage, freight, telegraph, etc., as Secretary	43 27
A494	Chas. Hey, appropriation to Northern Society	150 00
A495	C. G. Winn, appropriation to Central Society	150 00
A496	E. G. Mendenhall, appropriation to Southern Society	150 00
A497	W. K. Miller, program expenses	24 16
A498	R. A. Smyth, program expenses	12 39
A499	G. J. Foster, expenses Board meeting	8 00
A500	Bernice L. Foster, program expenses	6 00
A501	Hettie M. Anthony, program expenses	4 00
A502	H. Augustine, expenses Board meeting	8 00
A503	W. R. Soverhill, expenses Board meeting	12 00
A504	S. G. Soverhill, expenses Board meeting	12 00
A505	S. G. Soverhill, expenses delegate	21 40
A506	J. W. Stanton, expenses Board meeting	13 90
A507	J. W. Stanton, printing paid for	8 08
A508	J. W. Stanton, expenses Treasurer's office	113 63
A509	J. W. Stanton, Treasurer, program expenses paid	25 00
A510	L. R. Bryant, Secretary, salary, office expenses, rent, etc.	250 00
A511	L. R. Bryant, expenses Board meeting	20 33
A512	Louise Bryant, Assistant Secretary	25 00
A513	J. R. Shinn, Asst. Supt. Fruit Exhibit (refunded)	8 00
A514	Geo. Winters, Supt. Fruit Exhibit	12 00
A515	H. A. Aldrich, delegate expenses	21 25
A516	A. V. Schermerhorn, expenses Board meeting	12 94
A517	S. N. Black, delegates expenses	14 76
A518	E. A. Riehl, program expenses	6 24
A519	J. L. Hartwell, program expenses	10 55
A520	C. G. Winn, premiums	39 25
A421	J. L. Hartwell, premiums	23 25
A422	L. R. Bryant, premiums	14 25
A523	E. J. Baxter, premiums	7 75
A524	R. O. Graham, premiums	15 75
A525	W. B. Lloyd, premiums	9 00
A526	W. Miller, premiums	3 00
A527	E. A. Riehl, premiums	13 00
A528	A. Bryant, premiums	8 00
A529	S. G. Soverhill, premiums	16 25

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Warrant No.		
A530	Jas. Calvin, premiums	2 50
A531	H. C. Eckert, premiums	4 75
A532	E. G. Mendenhall, premiums	1 50
A533	J. Husband, premiums	7 75
A534	C. Ringhausen, premiums	18 75
A535	R. A. Simpson, premiums	5 50
A536	S. N. Black, premiums	4 25
A537	J. R. Reasoner, premiums	2 50
A538	H. M. Dunlap, premiums	9 75
A539	Jas. Poindexter, premiums	4 00
A540	J. F. Jolly, premiums	10 00
A541	W. H. Poff, premiums	3 00
A542	Void.	
A543	W. R. Soverhill, expenses Board meeting	11 92
A544	H. Augustine, expenses Board meeting	6 42
A545	H. A. Aldrich, program expenses	8 51
A546	W. B. Lloyd, Board meeting	18 71
A547	H. U. Bailey, printing	1 00
A548	A. V. Schermerhorn, Board meeting	12 50
A549	J. C. B. Heaton, Board meeting	13 65
A550	Geo. J. Foster, Board meeting	5 25
A551	J. R. Reasoner, Board meeting	6 50
A552	J. C. B. Heaton, Board meeting	18 10
A553	H. A. Aldrich, Board meeting	14 32
A554	J. W. Stanton, Board meeting	23 42
A555	Miss E. Jacobson, stenographer	203 30
A556	W. B. Lloyd, Secretary, office rent, etc	50 00
A557	Refund membership fee paid in error	5 00
A558	Illinois Central Railroad Co., freight on books	18 06
A559	C. & E. I. Ry., freight on books	13 71
A560	F. O. Grissom, printing	13 25
A561	Granville Cretors, packing books at Springfield	17 50
A562	H. W. Rokker Co., 4000 copies of 1906 report	1,306 50
A563	L. R. Bryant, proofreading, Vol. 40	50 00
A564	L. R. Bryant, expenses account Vol. 40	18 63
A565	L. R. Bryant, office expenses, drayage, etc	12 68
A566	J. F. Donovan, P. M., postage account Vol. 40	65 00
A567	F. H. Simpson, expenses committee meeting (ad interim)	11 30
A568	J. F. Jolly, expenses committee meeting (ad interim)	11 95
A569	W. S. Perrine, expenses delegate to New York	48 30
A570	W. S. Perrine, expenses committee meeting	5 75
A571	J. W. Stanton, expenses committee meetings, including Forbes committee	53 68

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Warrant No.		
A572	H. A. Aldrich, expenses committee meetings, including Forbes committee	61 24
A573	J. C. B. Heaton, expenses Board meeting	14 82
A574	E. R. Jinnette, expenses Board meeting	10 80
A575	H. A. Aldrich, expenses Board meeting	5 05
A576	H. Augustine, expenses Board meeting	4 10
A577	W. B. Lloyd, expenses Board meeting	7 04
A578	G. J. Foster, expenses Board meeting, committee meeting and telegraph	20 26
A579	W. B. Lloyd, six months' salary	200 00
A580	F. D. Voris, expenses committee meetings	20 37
A581	A. E. Bryant, expenses delegate to Wisconsin meeting	12 45
A582	H. W. Rokker Co., express, postage, etc., paid on Vol. 40	8 78
A583	First Nat'l Bank, Kinmundy, rent safe deposit box	1 00
A584	E. R. Jinnette and L. L. Casper, So. Soc., ad interim trip.	50 00
A585	J. R. Reasoner, Board meeting	11 10
A586	W. B. Lloyd, Secretary, postage, etc., office expense	37 92
A587	F. O. Grissom, printing	15 15
A588	Pantagraph Co., printing	13 75
A589	W. B. Lloyd, expense Board meeting	8 10
A590	E. R. Jinnette, expense Board meeting	6 65
A591	Geo. J. Foster, expense Board meeting	10 48
A592	J. C. B. Heaton, expense Board meeting	9 96
A593	W. R. Soverhill, expense Board meeting	17 16
A594	J. M. Jordan, expense Board meeting	10 43
	Total, General Fund	$4,021 62

EXPERIMENT STATION FUND.

221	E. J. Ayres, Salary Station No. 15 (1906)	$ 60 00
230	J. L. Hartwell, additional appropriation Station No. 16	10 00
231	E. A. Riehl, expenses director So. Dist.	17 20
232	E. H. Riehl, rent care and salary Station No. 8	75 00
233	J. R. Reasoner, for purchase stock Cent. Dist.	50 00
234	W. R. Soverhill, for purchase stock Nor. Dist.	50 00
235	W. R. Simpson, for purchase stock So. Dist.	50 00
236	J. W. Stanton, expenses Ad-Interim meeting	11 00
237	E. A. Riehl, grape vines	3 00
238	E. H. Riehl, rent care and salary Station No. 8 (1907)	85 00
239	J. R. Reasoner, salary and expenses director Cent. Dist.	27 08
241	J. L. Hartwell, salary and expenses Station No. 16	53 10
242	H. M. Dunlap, salary and expenses Station No. 4	83 00

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Warrant No.		
244	E. A. Riehl, rent, care and salary Station No. 8B.....	50 00
245	J. F. Jolly, rent, care and salary Station No. 11.....	77 80
246	W. R. Soverhill, balance on salary director Nor. Dist.....	11 42
	Total—Experiment Fund	$ 713 60

MEMBERSHIP FUND.

Receipts.

Dec. 10, 1907—Received during the year on memberships.....$116 00

RECAPITULATION.

Receipts.

General Fund	$5,669 10	
Membership Fund	116 00	$5,785 19

Expenditures.

General Fund	$4,021 62	
Experiment Fund	713 60	
Balance on hand	1,049 88	$5,785 10

SECRETARY'S REPORT.

W. B. Lloyd.

Complying with an order of your Executive Board, your Secretary has made an inventory of the property coming into his hands as Secretary. In doing this a few items have been found that may interest others than the members of the Board.

1st. There is stored in the fire-proof vaults of the Agricultural Building of the University of Illinois, a complete set, lacking Vol. 1, of the bound volumes of the transactions of the Society.

2d. In the same vault there are two copies of Vol. 5, one each of Vols. 6, 7, 8, 14, 17 and 21, and five each of Vols. 23 and 24, and Vols. 26 to 40 inclusive.

3d. There are in the Secretary's office at Kinmundy, 2733 Vols. of the Society's transactions—the oldest being that for 1889. There are also 136 Vols. of Reports of other State Horticultural Societies and fifty-one Vols. of Canadian and English agricultural and horticultural literature.

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Your Secretary can find no record of the date at which life members united with the Society prior to the time Secretary Bryant came into office. It seems to me it would be interesting, and some time it may be valuable, to have a record of the time at which life members came into the Society. At any rate your Secretary would be pleased so far as possible to obtain such dates, and respectfully asks every life member to record the date of his uniting with the Society when he registers at this meeting.

Your Secretary would again call attention to the few copies of our reports called for outside of our membership. Local Societies and Farmers' Institutes that ask for them are few. Can any one suggest a remedy?

During the past year there have been reported to your Secretary five deaths in the "list of members:" Harry Beauman of Tunnel Hill; Arthur Bryant, Princeton; Clairborne Hall, Athens; James T. Johnston, Warsaw; and Edgar Sanders, Chicago. The death of Robert Coith, a life member of the Central Society, has also been reported to me.

Following is a summary of the expenses of the Society since the last report:

Expense of publishing Vol. 40, 4,000 copies	$1,325 13
Expense of conducting Experiment Stations 1907	839 28
Expense of Executive Board meetings 1907	299 51
Expense of Committee work 1907	237 72
Program expense 1906	108 35
Premiums on Fruit and Vegetables 1906	223 75
Salary of Secretary	400 00
Superintendent of exhibit	12 09
Stenographer's report of State and District meetings	203 30
Moving office effects from Princeton to Kinmundy, including freight on books from State House, Springfield	60 39
Office rent, light, heat, and Asst. Secretary	125 00
Postage, express, freight and telegrams	117 41
Appropriations to District Societies	450 00
Reading proof Vol. 40	50 00
Printing and stationery	53 73
Delegates to other Horticultural meetings	128 59
Treasurer's Commission 1906	113 63
Total	$4,748 29

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PRESIDENT'S ADDRESS.

GEO. J. FOSTER, NORMAL.

Members and friends of the Illinois State Horticultural Society:

As we meet to hear the various papers prepared for this occasion, and to discuss the different topics presented; to ask and answer questions of mutual interest and to encourage each other by relating our experiences in the past, I wish to express the pleasure I feel in the beginning at seeing so many familiar faces present. Knowing as we do the value of friendship, let us all unite in a hearty welcome to the stranger and also those whose attendance has heretofore been somewhat irregular, to the end that all may become more interested, our borders enlarged and the cause correspondingly advanced.

I trust we have no discouraged ones among us on account of last season's experiences, because of all people, I think horticulturists are the most optimistic, most hopeful, although their normal condition may be said to be one of dissatisfaction with the present—yet they are never without hope—next time, or next year, somewhere in the future, this hope they feel sure will become a reality, and reward certain.

The year 1907 stands out in the mind of the fruit grower, prominent, unique and long to be remembered as the spring of early blossoming; when after a mild winter with little snow and no severely cold weather, with fruit buds abundant and uninjured, spring opened early in March with a remarkable period of hot weather beginning March 20th and extending to the 31st; during this period Japan plums came out in full bloom, and the early peaches were opening freely in most parts of the State.

Fruit trees generally were so much excited by this hot period that the buds were abnormally swollen and developed at least from fifteen to eighteen days earlier than usual—then came a change, on the morning of April 1st, there were six or eight degrees of frost and for a month or six weeks ice was plenty every few days—so that the wonder is there were any blossoms able to withstand such cold and produce fruit.

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Yet it is true that while the earlier fruits such as plum, peach, pear and cherry were nearly total failures, the apple in many places and from various causes produced a fair crop.

Small fruits generally, on account of the late cold were kept back abnormally two or three weeks, finally yielding very well, and the fruit sold for good prices. The grape being an exception, producing only a light crop of rather inferior quality.

As the subject of fruit usually receives a very large share of attention in all our papers and discussions, I wish to note at this time some other lines of work and especially those of shade and ornamental trees and shrubs, also the herbaceous plants and flowers all of which add a great deal to the comfort and value of our surroundings, and help to make life more enjoyable; and by this I do not mean so much to advocate the planting of those trees generally known as soft wooded and short lived, but more particularly those of slower growth, harder wood and longer life. It is to be regretted that today the average planter is more anxious to secure a Carolina poplar than any one of the long list of beautiful shade and ornamental trees, the wood of either of which would be both useful and valuable. Am I not safe in saying that thirty or forty years ago, there was planted annually in Illinois two shade or ornamental trees where one is planted now, and that one is usually of inferior quality.

Why is this? Why do we see so few trees of the better sort planted now? The old ones are fast decaying and should be replaced by young, vigorous stock, and of a far better class. It is because they are not appreciated in these days or because we are so much more interested in the tree or vine that will bring a dollar, than in the making of permanent improvements or the comfort and convenience of ourselves and families. How many of you have flowers as well as fruit on your table every day in the year? I know they can be dispensed with, so can many other things, yet they have an influence on our lives that is civilizing, refining, purifying and polishing, and there is not a home too humble to afford at least a few of these happy influences about it because they are so easily supplied. Among the more affluent ones, the spectacle of men, with touring cars costing thousands of dollars who rarely if ever spend a dollar for a plant of flowers, is altogether too common. I plead therefore for a broader vision, of the simple life, and a higher standard of living; as the exponents of all that is best in life we should not only live up to our privileges, but by both precept and example encourage others also along these lines; not that there should be less fruit, but more flowers.

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As the natural timber of Illinois is rapidly disappearing, again we wish to call attention to the matter of Forrestry; which in some of its forms would undoubtedly make a valuable adjunct to diversified farming on many Illinois farms. Take for instance the growing of fence posts which can be made a profitable investment on any good land worth not more than a rental of five or six dollars per acre per annum. As will be remembered Mr. S. N. Spring at our last annual meeting contributed a valuable paper on Forrestry in which he says, "The value of growing posts and material for home use on a limited area, and the great protection afforded to crops and the farmstead by shelter belts and woodlots, is not fully appreciated by the Illinois farmers;" further, and it is a very significant fact, many of the large railway corporations are planting timber trees very extensively simply to supply their needs. And each neighborhood if not every individual might with profit follow this example, but whether for profit or for pleasure, let the work go on, believing as one of our nature loving poets has said:

"Give fools their gold and knaves their power,
Let fortune's bubbles rise and fall,
Who sows a field or trains a flower,
Or plants a tree is more than all."

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ONE MINUTE TALKS.

SUBJECT: "FREAKS OF APRIL FROSTS, 1907."

MR. HEATON—One of the most regretable freaks in the hill section, that part of the state known as the Ozark hills, was the failure of our apple crops, a thing that has not happened before for twelve years, and a great many of us were coming to think that we were immune. The late spring frosts, however, caught us this year and not only on the hilltops, but in the lowlands just the same, and it seems that the frost had no reference in its work to the theory that the hills were exempt. There were some instances in our country that were very remarkable. It seemed to come in spots. There were three "forties" of land that I took particular notice of that were adjoining. On the west forty there were quite a few peaches and apples; on the middle forty there were no peaches at all, worth getting; on the east forty there was a heavy crop of peaches—the trees were bent under the load of fine peaches. Now, so far as air drainage, elevation or natural advantages were concerned, there was nothing that one had over the other that could be distinguished. Then again we had some very high hills with peach orchards. On the hill that has always been considered the best located hill in our community, there was no fruit, another hill just across a little valley, not so well located so far as theory is concerned, had a fine crop of peaches of the same varieties, and I could refer to many such instances. For instance, an apple orchard that was located on comparatively level land and with no superior advantages for air drainage—in fact, it was not a place that one would select expecting to escape a frost when other places were hurt, that orchard had more apples on it than any other orchard in our whole country, and there were many orchards that were better located, had better air drainage and better advantages so far as theory goes than it had and yet it had more apples than any other place in the country. I am in the South, but I can refer you to many instances there that seemed to put to rout all our theories about elevation and air drainage. It seems the frost last spring performed more freaks in our country than we ever noticed before.

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THE PRESIDENT—If there are any fruit growers in the house that the freaks did not catch last spring, let them keep still, let us hear from the others. Mr. Aldrich, how was it with you?

MR .ALDRICH—Well, it caught me this year. It is the first failure in the old orchard that I have had for twelve years. Of course, I have had some years that I called failures, but those years I shipped five cars of fruit, but the fruit was not what you might call first class. But it was the first failure for twelve years.

THE PRESIDENT—How about your theories? Mr. Heaton says he was knocked out on theories. How about air drainage?

MR. ALDRICH—My theories get knocked out every year. What I learn the year before I have to unlearn the following year. The conditions are different, so that I begin to think I do not know anything.

MR. LUTENER—I have a little orchard on a hillside and I gave pretty good cultivation to it the year before and it bloomed pretty well last spring. There were some hard frosts and I pretty nearly gave them up, but I did spray and I got some apples, more than I had last year, and I was about the only one that had any in that neighborhood. My hillside slopes to the southwest. We did not have peaches.

MR. TANNER—I did not observe those freaks that have been spoken of. The failures I attribute to the excessive cold and continued cold, for the trees which were in full bloom when the first cold weather struck us were a complete failure and the varieties that bloomed after the freeze made more or less of a crop. Some of the varieties, namely, the Jonathan and Grimes Golden, had partly bloomed when the first freeze struck us and I suppose the small crop we had on the Jonathan and Grimes Golden was due to the later blooms. Wine Sap and York Imperial and a few other varieties in which the bloom was held until after the freeze was past made more or less of a crop throughout our section, so I attributed the damage entirely to the cold weather.

MR. GOODRICH—We had more freaks than common down in Egypt. The freak that we had was more destructive than common, because we had the few frosts that Mr. Tanner speaks of and then the cold after the few frosts. I had completed a lot of spraying, I think I had been over all my trees of all varieties, pears, peaches, plums and apples. After that came the frost and killed the crop, after I had sprayed it. The freeze came and took the crop, everything except apples, I had a pretty fair crop of apples, while on

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the other side of the railroad, a mile or so from me, the freak was emphasized by taking their apples and leaving their peaches, just the reverse. The year before I had peaches and they had apples; last year I had apples and no peaches, and they had the peaches—one gentleman having an orchard that made him several thousand dollars in peaches; right adjoining, in plain sight of it, they had no peaches at all, the trees absolutely did not produce; showing that, as the gentlemen say, it was a spring of freaks, unaccountable in any way. The frost settled down in one orchard and raised up and seemed to miss the next one and pass over, but with me it was the strangest combination of freaks, because it took the crop that I had expended the most money on.

THE PRESIDENT—Had the peach crop that you speak of bloomed?

MR. GOODRICH—Yes, everything was in bloom, peaches, pears and apples; then the cold came. I usually ship several carloads of pears, this year I had none at all and not peaches enough to count. I shipped a very good crop of apples.

MR. AUGUSTINE—Well, I am like my friend Tanner, I think it was the cold weather that did the business with me. The thermometer in my orchard got down to eighteen and it not only froze the fruit, but also the twigs, the newly grown twigs; but the surprise to me was that with the constant hard freezing of nearly the entire month there was any fruit escaped and it is my judgment there was nothing escaped that was in bloom before or during the freezing weather, it was nothing but the few blooms that came later that escaped.

MR. TANNER—Would not you except the peaches from that remark? The peaches were in full bloom at the time of the freeze and they made considerable of a crop.

MR. AUGUSTINE—I was speaking locally. We had a pretty good setting of grapes and I cannot account for their being so very imperfect. We had a respectable crop but they were almost worthless because of their inferiority and in a condition that I have never seen before. Of course, you understand, it is in my orchard in this state of which I am speaking. We had hoped for weeks almost, that the Keiffer pear would pass through, they would freeze at night and thaw out during the day and still hang on, but finally when the cold weather passed away, they all dropped off.

MR. RIEHL—With us it was very much of a failure, generally. I think that I had more apples than there were in the rest of the county. With peaches we had some varieties that had a good crop

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and some had none. A good many we lost through rot on account of the wet season. Cherries we had none of any kind. In plums, we had a few varieties of the hybrid Japanese. The American Chickasaws were gone, there were no Damsons and most of the Japanese failed, but a few varieties escaped. There were no quinces; there were no pears. In grapes we had a splendid show in the early part of the season, but it was too cold and wet, and even those that matured were not as good in quality as we usually have them. A great many were worthless for anything but jelly. With us it has not been a profitable season at all in fruit growing. Our blackberries were good, raspberries were good and strawberries fairly so.

THE PRESIDENT—Is it not true that as a general thing the country over the grape crop was similar to what you have stated, and why was it?

MR. RIEHL—That is a question I have often asked myself, not only why any such things happened this year, but other years the country over, why is it that even in the Eastern States peculiarities of the crop seemed to be general all over the country? It is more than I can understand. I know that so far as grapes are concerned, that seems to be the general report from one end of the State to the other; some localities are worse, some are better, but as a rule the condition applies to the whole State.

THE PRESIDENT—I also have heard complaints from other States. Michigan makes much the same complaint. Mr. Palmer of Wisconsin, what about the grapes in Wisconsin, did you have a good crop this year?

MR. PALMER—Not generally. I think Mr. Fox in Baraboo had a pretty good crop of grapes, although they were late—they were the second setting. The first setting I think was killed.

THE PRESIDENT—We were referring not to the setting of the crop, but the damage it seemed to receive during the season.

MR. PALMER—I think his crop of grapes was pretty good. He is the only grape-raiser to any extent we have.

MR. HUNTING—I have in mind some experiences that possibly might be of some benefit to relate. I noticed in my orchards that the Maiden Blush came through in better condition than any other variety that I have. I attributed it to the fact that the bloom comes out in a close, compact bunch, the stems very short and buds protected from the frost. When it comes to the Ben Davis, I tried to study the effect of the freeze on the Ben Davis, it was almost a

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total failure with me; but there is one thing that I noticed in studying the results of the frost, and that was, that the portions of my orchard that were best cultivated withstood the freeze in the fore part of the development, while the orchard that had the least care did not have anything at all; that is to say, more of the apples formed and started to grow on the cultivated part; I thought they were going to go through, and I was going to have a pretty fair crop on that portion of the orchard that had been best cultivated, but the freeze continued and the effect was such that it reduced that to almost nothing; but they did show more vigor and more strength and I have about made up my mind that, as a general proposition, it depends largely upon the vigor of the tree—the constitution of the tree, and while none of them perhaps were able to go through this series of disasters, that under ordinary circumstances where the effect is not so great, that a well cultivated orchard would go through, whereas one that has been neglected would not go through. I believe the care, surroundings and environments of trees have something to do with it. The treatment of the orchard two years previously has something to do with it. I think as a general principle that by taking good care of our orchards, many times where the freeze is not so severe we may go through all right. We talk about the freaks of the frost, it seems to me that it is the regular business of the frost to kill our apples, rather than a freak; the freak comes in when we have a good crop of apples and it escapes. I remember a few years ago that it came very near not being the April frost that we speak of in this topic, that perhaps the real frost was on May 1st, and we lost our entire crop. I believe that while the frost has not killed our apples outright each season, it has so weakened them that they finally fall off and the crop is lost with the exception of a few orchards, I can acount for it in no other way. When we see an orchard here and there that has a good crop, there certainly must be some good reason for it.

MR. STANTON—From my observation and experience the freaks of the frost were damaging, or rather, killing the fruit when the buds were in a certain stage of development. I do not believe that the elevation and cultivation or the conditions have anything to do with it, cold weather killed the fruit; but the cold weather only killed it when the buds were in a certain stage of development. The reason I say that, is because certain varieties whose buds were in a certain state of development came through and made good crops. I am speaking now of our community and it will apply to a large extent over Southern Illinois. The York Imperial came through and wherever there was a vigorous tree there were good

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apples, where they were properly taken care of and cultivated. Where they had Rome Beauties, as a rule, and the orchard was properly taken care of, they had a crop. Now, those trees were in bloom at the same time, they received the same freeze, but at a different stage of development. They were under the same conditions in the same orchards, therefore I say it must have been the stage of development of the fruit, at the time the freeze occurred, so that anything we might do, or anything we might suggest here does not it seems to me have very much bearing on the situation aside from the fact that the trees that were properly cared for and cultivated, certainly would stand much more of it than those that were not. I think that is pretty well understood, but the past season has satisfied me that it was the stage of development of the fruit bud at the time the freeze occurred. These other varieties bore good crops and in the same orchards and under the same conditions. Not only that, but peaches were at that time, with us, as big as peas and every peach tree in our community that had any life about it at all was full of peaches and they were under the same conditions, it was the stage of development that enabled them to come through. A gentleman made the statement here that he thought his orchard, because of its being cultivated, came through. I think that is a good thing to tell, because I think that orchards ought to be cultivated and sprayed and I believe there are seasons when they will go through with a crop of fruit when otherwise they would not go through a frost—but we did not have a frost, we had a freeze.

MR. PALMER—Of course we were behind this freeze partially—we had the freeze the same as you did, but our trees were not as far along, but the orchards that were well taken care of for years back had a good crop of fruit and those that were not had gnarled fruit.

MR. STANTON—I would like to ask the gentleman if that is not usually the case.

MR. PALMER—Other years we have sometimes shipped as high as forty or fifty barrels of apples from Baraboo, and this year we did not ship more than eight or ten.

MR. GRAVES—We had a variety of experiences in Missouri. I am a strawberry grower more than I am a tree fruit grower, and I found that in our work freaks occurred, and as disastrously as among the tree fruits, and we had in that, something that seemed to be contrary to our accepted notion of things. A gentleman here remarked that orchards that had received the best cultivation were

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the ones that passed through the frost in the best way. In Missouri the strawberries that were most neglected were the ones that escaped the best. I would not draw the conclusion from that, that it is better to neglect our strawberry fields. In a vineyard I have there, are two elevations and a valley between. I noticed that the effect of the frost on the vineyard was the most serious on the elevation and the valley was the best protected. In that vineyard, the rows run east and west and the valley runs east and west through the elevations. The winds were from the north, cold driving winds, according to my notion, the reason the frost did the most damage on the elevation was because the winds drove over the valley, and consequently that part of the fruit escaped the best. I noticed both in orchard work and in strawberry work that the frost seemed to rise and fall, cyclonic in its nature. It seemed to bound and rebound, and moving in that way some orchards and strawberry fields escaped the most damaging influences of the frost, so there is no theory that we have formed with regard to elevation or with regard to protection, natural or otherwise, that seems to stand before this frost. For example, there was a valley that had high hills on both sides, quite a creek flowing down between the hills; in that valley there were a number of strawberry fields, and on ordinary years when the frosts seek the lowest levels, those fields are damaged the most by the frost, but last season it was just the reverse, the valley lands were protected, but in this particular valley it was noticed that a kind of fog settled down in the valley, and the fog being warm, protected the valley so that the strawberries in that vicinity passed through with less damage than those on the hill top. But looking at all these matters I cannot see anything in it that will console us with regard to our theories. I do not know but it is a kind of eye-opener, a blessing after all, because it teaches us that we must study and restudy and work over or dispense with our theories and go on with our work.

MR. AUGUSTINE—I just want to drop a thought, not that I have any theory especially, but may not a great deal of the condition be owing to the 1906 October freeze? I speak of this for this reason: In certain localities the young peach trees that were growing in the nursery and growing thriftily there did not seem to be affected by the freeze, but were so injured that when taken up and stored in cellars, which they always are, at least in this section of the country, there were very few, if any, that grew last spring and it was without question owing to the injury of the October freeze, and I have thought along during the summer that possibly some of these freaks that we are speaking about, were perhaps owing to the condition of the trees in that October freeze. Now,

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an orchard that was highly cultivated up to that time and was in a growing condition would naturally suffer more than an orchard that had been in grass perhaps and not growing. By this I do not mean to advocate at all, a lack of cultivation, because I believe in the cultivation of an orchard, but I simply throw out these thoughts that we may put them with our other theories.

MR. ALDRICH—During the conditions this spring there was one thing that I noticed and it led me to think that our fruit would have passed through at the time of the frost if it had not been for the hard winds, which just seemed to whip what little foliage and buds there were to pieces. It was first one way and then another, and it kept the little twigs working until it wore the little stem out. Anything that had not started enough but that it sat close, so that it could not blow about—that made fruit. That is one thing with the peach trees; the wind whipped the leaves off the apples, it could not whip the leaves off the peach and they remained in bloom, that made me think it was the hard wind. The hard wind whipped my rose bushes to pieces, after a hard, windy day they were just wilted, and the little twigs on the apples and roses and all shrubbery were just hanging limp, when they never stirred with the frost.

MR. STANTON—I would like to ask some of these gentlemen that advocate the idea of injury in October or from any other cause, if they can explain why the trees of Rome Beauty, York Imperial, Grimes Golden and other varieties right along under the same conditions bore good crops. They received the same treatment at the hands of the freeze and in cultivation and in care. Now, if the October freeze would injure one, why did it not the others?

MR. AUGUSTINE—Might it not be that those varieties were ripened up better and were in a better condition?

MR. STANTON—I have made up my mind it was the stage of development of the fruit bud. I want some information on that line. I have never yet found any theory that disabused my mind of that, that it was the stage of development of the fruit bud at the time the freeze occurred.

MR. TANNER—I agree entirely with Mr. Stanton. I had four rows of York Imperial through an orchard; our ground was entirely level and the treatment accorded in the orchard was exactly the same. These four rows of York Imperial averaged from four

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to six bushels to the tree, while eleven rows of Gano running side by side with them did not have four bushels to the eleven rows. Four rows of Jonathan running through the same orchard averaged a bushel to the tree. The treatment was exactly the same, the stage of the bud at the time of the freeze was different. The York Imperial had barely started to push its buds, the Ganos were in full bloom, the Jonathan had about half bloomed, and the bloom of the York Imperial came out entirely after the freeze was finished, and the Jonathan completed its bloom after the freeze was finished—along the early part of May.

MR. HUNTING—It is not certain that it is on account of the stage of the bloom in these two varieties, because of the fact that it might be in the make-up of the tree and the nature of the tree, that its constitution might be able to bear more freezing than that of another. I think there is no question but that some varieties are better able to withstand the freeze than others. As to the trees being killed in October, or in the fall, I do not believe it. I am of the opinion that trees are never killed until the sap comes up in the spring.

MR. HEATON—I have a row of trees a quarter of a mile long, ten feet apart; commencing on the south end of that row, they were in full leaf when the first frost came, leaves and twigs about four to six inches long—the new growth. Commencing on the south end of that row, after the first four or five trees, there were two trees on which the leaves were not killed, all the rest were killed. Going on about 100 rods farther, there were two or three more trees not killed. Going across a little valley and up a little hill, about half way up the hill there were three trees where the leaves remained green through that cold weather and every other tree in that row was killed. I think the topic is well named "Freaks."

MR. LUTENER—I neglected to say that my trees were young trees. I got more Jonathan than I did last year. My trees were planted, Ben Davis, Jonathan and Grimes Golden, alternately. My best fruit was in the central part of the orchard. I found that the best apples seemed to be the ones that were in the early bloom. The first bloom seemed to be the best.

On motion of Mr. Aldrich, the president was asked to appoint a committee to revise the score card, with instructions to report as soon as possible.

The President announced the following committees:

Reception Committee—T. E. Goodrich, J. W. Stanton, H. A. Aldrich, L. R. Bryant and H. Augustine.

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On Treasurer's Report—H. M. Dunlap, E. R. Jinnette and W. R. Soverhill.

On Final Resolutions—J. Mack Tanner, B. C. Howe and J. R. Reasoner.

On Judging Exhibits—Class, 1, E. A. Riehl; Class 2, L. F. Dintlemann; Class 3, W. R. Soverhill; Class 4, Edward Lutener; Class 5, T. E. Goodrich; Class 6, J. H. Jordan; Class 7, J. C. B. Heaton.

On Revision of Score Card—H. A. Aldrich, and judges of exhibits.

WEDNESDAY—AFTERNOON SESSION.

ONE MINUTE TALKS.

SUBJECT: "WHAT I HAVE LEARNED AT HORTICULTURAL MEETINGS."

MR. STANTON—I notice Senator Dunlap is in the room. He has attended several meetings during the last few years and ought to be able to tell us something of what he has learned.

MR. DUNLAP—One of the things I learned is to keep quiet, because if you express an idea one year, next year you are liable to have to take it back. That is one of the things that I have learned; what we learn in one season, it does not follow that that does not have to be unlearned at some future season and it is like many of the things that were learned fifty years ago, we find that we have to unlearn them. One notable example is that in the horticultural meetings of fifty years ago, every one was talking about protection to the orchard and that one had to plant windbreaks all around in order that they be protected from spring frosts. Following out experiments in later years, we find that what we need is good air drainage in the orchard to prevent injury from spring frosts. So there are many things that must be considered. I never attended a horticultural meeting yet but what I got enough out of it, either during the sessions or between sessions, that I was able to pump out of some member that knew something about horticulture, that I felt well repaid for all the expense and time involved in going to the meeting.

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MR. PERRINE—One thing that I have learned in connection with horticultural meetings is that I do not get very much from the meeting when I am not there. A great many of our fruit growers over the State think they can get from somebody else that does go, a report of the meeting, or that they can get it from the volume. Now, I think a great deal of the volume, and I think we can get something from the people that do attend, but that it is not like attending ourselves. We get a horticultural uplift from these meetings that we cannot get in any other way, and I have learned that at the horticultural meetings we learn a great deal outside of the meeting itself in conversation with other growers. We can get about as much from them out of meeting as we can in meeting, and that suggests to me that sometimes we growers do not tell as much in the meeting as we ought to. We do not tell the whole truth sometimes, that is, we do not go far enough, we are a little bit guarded. I think it is all right to be careful in our statements and yet we do not want to be too careful. I find a grower will tell me a great deal more, privately, than he will in a public meeting. Perhaps that is all right and yet I believe we ought to give the whole truth in the public meeting. Perhaps we do. When I came home from school in 1889, to take my brother David's place, who died, I thought I knew a great deal about fruit growing. I attended the horticultural meetings for two or three years and then dropped out for a number of years and I lost a great deal by missing those years. Then when I did start attending the meetings again, I learned to spray with the Bordeaux mixture. I think that was about the time that spraying with the Bordeaux mixture began and since then we have been getting some results, not satisfactory results always, but we have been getting results since then. I do not believe as apple growers, or as any other kind of fruit growers, we can afford to miss these meetings. As I said before, we get a horticultural uplift that we cannot get in any other way.

PROFESSOR GRAHAM—I have received many suggestions at horticultural meetings that have been of decided advantage to me, and they have not all been suggestions that were in themselves right. I have learned many things from suggestions that were wrong, and suggestions that when I came to put them into practice I found to be wrong, but they started me along a line of work that proved beneficial and from which I learned something. I do not care if a man gets up here and in dead earnest and believing in what he preaches gives us something new to think about that he heartily believes in. If it is right we learn something; if it is not right we learn something, because if it is not right, we try intelligently to learn something about it. But I for one can say that

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there has not been a horticultural meeting that I did not take away something from that was useful to me in my work. Some time ago I went to Knoxville to the meeting of the Central Association, and one thing I gained there was well worth the trip, and that was something I learned about raspberries. We are raising raspberries in a small way and were having trouble with certain points and I believe I found where the trouble lay and I went home well satisfied with that meeting, and that has been the case with me for every meeting I have attended.

COMMERCIAL GROWING OF WINTER ONIONS, MUSKMELONS, CUCUMBERS AND TOMATOES.

E. R. JINNETTE, ANNA.

Down in Southern Illinois along the Illinois Central railroad winter onions are a profitable crop. They can be planted any time from the last of July to the first of October. But most growers like to plant the latter part of August. Planted then, and cultivated once or twice, they will make a fine growth before freezing weather.

Like all others of the onion family, winter onions require a rich soil, and it is not worth while to plant them on any other. It is highly important to have the land in fine condition, and the fertilizer available so that the onions will start quickly and grow rapidly. Under proper conditions they will be almost large enough for market by the time the ground freezes up. Severe freezing kills the tops, and checks the growth, but does not hurt the bulbs. With the first breath of Spring they begin growing again, and they can be harvested in time to use the land for some other crop.

Planting the onions is somewhat tedious, since it must all be done by hand. The bulbs are stuck tops up an inch apart in rows fifteen inches wide, and covered with an inch or two of soil. Late in the fall the plants are usually slightly hilled up with a garden plow. This insures a good length of white bottom to the onions. Both bulbs and "tops," or bulblets, are used for planting, but the bulbs produce larger crops and finer onions. However, by selecting the large bulblets good marketable onions can be grown, but they are usually planted to make seed for the next year. It used to be considered necessary to remove the roots and remains of old seed stalks from the bulbs before planting, but experience proves that they will grow just as well without trimming.

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In the Spring as soon as the tops have made sufficient growth the onions are dug, the roots and all brown blades trimmed off, and tied in bunches of from four to six, depending upon the size. The tips of the blades are cut off, leaving the bunches about ten inches long. They are shipped in flat cases holding ten dozen bunches. The cases should be packed snug but not too close or the onions will heat. The trimming and tying are usually done by women and children for two cents per dozen bunches.

Here are some of the strong points in favor of winter onions: They are planted after most other crops are off; they are harvested early, permitting the land to be used for some other crop; rust and blight do not affect them; they have no insect enemies; they require little cultivation, and if the soil is right a crop is sure; if the market is not satisfactory for green onions they can be allowed to mature, and then sold for seed. Of course there are seasons when the profits on green onions are small,but this is true of all crops not excepting the "big red apple," but the grower who sticks to them faithfully is sure to win out in the end. The profits on winter onions will run from $75 to $300 per acre. Last spring they were selling at $3.00 a case at the close of the season.

Muskmelons, or cantaloupes, are a profitable but difficult crop to grow. Few things are more exacting in regard to soil and treatment, and none so sensitive to weather conditions. Improper cultivation or a soaking rain at certain stages of growth will cause the young melons to drop from the vines. A heavy rain when the melons are ripening is likely to destroy the flavor of several pickings.

In Southern Illinois the netted gem is grown almost exclusively, and under favorable conditions an acre of these melons will net the grower from $150 to $250. But to secure these results he must almost live with his melons from the time the seed is planted till the last melon is harvested.

The plants are started in forcing beds heated with fire. The seeds are planted in dirt bands from the first to the tenth of April. Dirt bands are bottomless boxes four inches square and three inches deep, made of thin strips of veneering. The boxes are placed in the bed without tacking, and pressed down into the soil to hold them in place; and then filled with rich, loamy woods soil. The soil in the boxes is firmed down and allowed to stand until the bed is thoroughly warmed before the seeds are put in. With good seed three to the box are enough, and if conditions are right the plants will be up in three or four days. When the first rough

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leaf appears the plants are thinned to two in a box, though some growers prefer to defer thinning until the plants are established in the field. Constant care and watchfulness are necessary to secure strong, stocky, well rooted plants, and success depends much on this. Mice may get into the beds and play havoc with seeds and plants. Moles get in and push up the boxes. The first brood of striped beetles are likely to find the young plants and swarm into the beds while they are uncovered during the day. So that a few hours' neglect may mean a lot of damage.

The plants are kept in the hot beds for three or four weeks, and then transferred to the open field when the danger of frost is over. Before taking them out of the bed they are thoroughly wet to keep the dirt from falling out of the boxes while they are being handled.

Melons do best on hill land, provided it is well supplied with humus. There is no better fertilizer than well rotted barnyard manure applied broadcast, and in the hill. A southeast exposure should be selected for early melons. The main things to be observed in transferring the melons to the field are careful handling of the boxes, and thorough packing of the soil about the plants as they are set out.

Melons require intensive culture. It should begin as soon as they are in the field, and continue until the vines cover the ground. At first the cultivation should be deep and as near the plants as possible without disturbing them. As the vines and roots extend it should be further away and shallower until at last only the surface is stirred.

Melons ripen rapidly and after the season is well opened they should be picked twice a day. Unless this is done there are likely to be a good many too ripe for shipment. Quite a bit of experience is necessary to tell when a melon is just right for shipment. If too ripe it will break down quickly. If too green it is tough and leathery, and flavorless. To secure top prices nothing but good stock should be shipped, and it should be carefully graded in packing. Three grades can be made—topnotchers, firsts and seconds. For topnotchers there is no better package than the little crate holding sixteen melons. Climax baskets are all right for the other two grades, and they can be distinguished by using a two-slat cover for the firsts, and a single-slat cover for the seconds.

Rust, wilt, aphis and beetles render the way of the melon grower exceedingly hard. Rust can be controlled to some extent by frequent spraying with dilute Bordeaux. Little is known about

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wilt, and so far no way of fighting it has been found. It is said that aphis can be destroyed with kerosene emulsion, but their habits render its application very difficult. The surest way is to burn infested plants at once.

What has been said about growing and handling melons applies to cucumbers, except that they do better on bottom land, and require more manure. In fact, there is no danger of using too much manure on cucumbers if it is well rotted.

Tomatoes are grown commercially both for the early market and for canning. This paper will deal with growing them for the early market. For this purpose the plants must be started in February. Growing tomato plants in February means a contest with Old Mother Nature. You are trying to force her to do the work weeks before she is ready. Success will depend upon close attention to such details as thorough preparation of seed bed, proper temperature and ventilation. "The tomato revels in a high temperature, and not only is the growth checked, but the plant is injured by a low temperature in the early stages of its growth." The temperature of the hot bed should be kept between sixty and ninety degrees, but a slight variation either way for a short time will do no serious harm. Next to temperature in importance is ventilation. The beds should be ventilated every day, but it must be done without exposing the plants to a cold wind.

When the young plants show the fourth leaf they are taken up and pricked out in rows two by three inches. If possible this should be done on a warm sunny day. In any case the plants should be protected from a cold wind while being transplanted. It is a good plan to work over and rake down the soil in the bed before re-setting the plants. Stirring the soil occasionally between the plants will help to push them along. From now on the beds should be kept open as much as possible during the warmest part of the day in order to harden the plants and prepare them for the cold frames. It is important to have the soil in the cold frames in good condition before the plants go into them. This will not be difficult if the necessary work on them was done during the fall and winter.

When six to eight inches high the plants are transferred to the cold frame, and set in rows six by six inches. The change from hot bed to cold frame is trying, and the plants will wilt badly unless they are shaded for a few days. After they get used to their new quarters they should be left uncovered when the weather will permit.

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The best growers cultivate the plants frequently while they are in the cold frames. When the danger of frost is over the plants are taken to the field, and set in rows four by four feet. Commercial fertilizer at the rate of two to four hundred pounds to the acre is applied in the hills, and mixed with the soil as the plants are hilled up. Cultivation begins as soon as the plants are all out. Some growers use the double shovel entirely. Others use it at first, but finish with the cultivator. A few years ago tomatoes were staked and tied up, but few growers do this now. They claim that any benefit from staking is more than overbalanced by the cost of stakes, and the expense of tying.

Land that will produce good crops of corn is all right for tomatoes. A southeast exposure will produce the earliest tomatoes, and bottom land the heaviest crops.

Discussion.

Mr. Dunlap—In the cultivation of tomatoes, I would like to ask if he uses any straw when they are lying on the ground to keep them off the ground.

Mr. Jinnette—No. Let them sprawl over the ground at will.

Mr. Dunlap—Is there any objection to the use of straw?

Mr. Jinnette—No, sir, only it is expensive and most growers do not have it.

Mr. Periam—They will be more likely to rot with straw than to lie on the ground itself. That has been my experience. Of course they must not lie in the mud. I want to speak upon another subject that is worrying my old age. We used to use sods for early plants, and, by the way, I think I know something about cultivation of tomatoes when Cook county was a wilderness of grass. I was obliged, because we could not buy pots in Chicago, to invent something to plant them out with. I finally struck the idea of sawing up fence boards and sidings into three-foot lengths and constructing troughs and planting my seeds of various kinds that I wanted to force in my beds in those troughs. There were in those troughs six inch cubes and if tomatoes were planted in there, it was a single tomato that was in that six-inch, or sometimes they were five-inch cubes. In working lettuce we transplanted three times, but the last transplanting of lettuce would be two inches by six. But now we come to the principal thing, and that is the vines. Now, Mr. Chairman, two years ago I talked about this whole subject of troughs for transplanting, we could not buy pots and I thought up

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this matter and invented those troughs and filled the bed completely full with them, first the back and then next to the front and so on, so that the whole hotbed was filled with those troughs. Now, I am going to speak especially of vines, melons, muskmelons, watermelons and squash. I have transplanted from those troughs muskmelons, watermelons, tomatoes, egg plants, even peppers, and I have transplanted Hubbard squash when they were in bloom, and there is no need of pressing the earth about them especially except the outside, because they never knew that they were taken from the hotbed in June and transplanted out of doors. It costs nothing, almost, and today when you can get plenty of pots, I use the same thing, because we get one-third more earth in this square than we can in an earthen pot. Now, to prove this, the year before last in Michigan, where I sometimes go to stay in the summer, I was setting out a good garden, there was nearly an acre of it, I got a glass and prepared it, and among other things I had Hubbard squash. All my vines were in full bloom and some cucumbers in fruit when I transplanted them the middle of June. My next neighbor came over there and said: "Mr. Periam, I have heard that you are a very good gardener over on the other side of the lake, but I am astonished to see you planting out in this hot sun and no water." I said, "My friend, if you come around here about two o'clock, and you find them badly wilted, I will say I made a mistake. I say you are mistaken about there being no water, and you take them out of these troughs saturated with water. The question of a little water around the outside does not do any harm." The old gentleman came around about three o'clock and everything was all right. The lima beans were in full bloom when they were set out. He came around, and everything was all right, and he said, "Well, I am astonished, I cannot do that, I try to do that but I cannot." Now, then, it is astonishing to me that with this simple way of doing business, that the extensive planters will still stick to the strawberry box. These troughs will last five or six years and every farmer can have his own stuff right there at home with two sashes of glass to make the first start with, after that I use nothing but cloth frames, and the hotbed has but very little heat under it, for the reason that I do not want to set these plants out until the ground is permanently warm, and there is the whole clue to the subject. You can keep them in these troughs. I have been preaching this thing now for forty years, trying to get my men to do it that way. You can put them into a wagon as they come out of the bed and carry them twenty miles and one man can lift these boxes out very easily.

THE PRESIDENT—Did Mr. Periam make himself clear as to this kind of box or whatever it is he advocates?

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MR. PERIAM—Why, it seems to me it is as easy as falling off a log. It is simply to saw fence boards, sizing them into pieces three feet long and nailing the sidings against the fence board.

PROFESSOR GRAHAM—Why do you say three feet long, why not sixteen feet, why do you cut them that length?

MR. PERIAM—Because if they are longer they are too heavy for a man to lift.

MR. GRAVES—Do you have a partition between?

MR. PERIAM—I do not want a partition. If you have a partition you destroy the anchorage of the roots.

MR. GRAVES—In removing them you cut through there?

MR. PERIAM—No, sir, I do not.

MR. GRAVES—Break it off?

MR. PERIAM—No, sir, I pull the roots out. It does not hurt them at all.

A motion by Mr. Reasoner that a committee of three on Memorials for deceased members be appointed was carried, and the following were appointed: Prof. J. C. Blair, Messrs. H. A. Aldrich and J. L. Hartwell.

The following report on Revision of Score Card was read and adopted:

To remodel our score card by dropping the heading, "uniformity," as use and experience has shown that now we score twice, once under that heading, and again under the headings "form," "size" and "color."

Also to arrange the card so that we can score either for market or desert, say as follows:

APPLES AND PEARS.

	Market.	Desert.
Form	15	15
Size	20	15
Color	25	20
Quality	15	25
Freedom from blemish	25	25
	100	100

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PEACHES.

Form	10	10
Size	25	15
Color	20	20
Quality	20	30
Freedom from blemish	25	25
	100	100

PLUMS.

Form	10	10
Size	25	15
Color	25	25
Quality	15	25
Freedom from blemish	25	25
	100	100

CHERRIES.

Form	10	10
Size	25	20
Color	25	20
Quality	15	25
Freedom from Blemish	25	25
	100	100

GRAPES.

Form of bunch	15	15
Size of bunch	25	15
Size of berry	15	10
Color	10	15
Flavor	15	25
Freedom from blemish	20	20
	100	100

There are times when it is not advisable to cut the specimens, so it is impossible to judge their quality. In such cases it would perhaps be better to score all plates alike for quality or to distribute the points given to quality among the other headings. In such a case the cards would read as follows:

APPLES AND PEARS.

Form	15
Size	25
Color	30
Freedom from blemish	30
	100

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PLUMS, PEACHES AND CHERRIES.

Form	10
Size	30
Color	30
Freedom from blemish	30
	100

GRAPES.

Form of bunch	15
Size of bunch	25
Size of berry	20
Color	15
Freedom from blemish	25
	100

Rules for use of score cards:

1. Any variety not true to name cannot compete for a prize.

2. Uniformity—In all score cards the matter of uniformity must be taken into consideration in judging form, size and color.

3. Form—In judging form the specimens exhibited should be the normal form for the variety as grown in the district represented, and should be uniform.

4. The specimens should be of average size (not abnormal) for the variety as grown in the district represented and they should be of a uniform size.

5. Color—The color should be distinct and show all the natural characteristics of the variety as it is grown in the district represented. The specimens should be uniform in this respect. Polished specimens should be discriminated against. The bloom, if any, should be present.

6. Freedom from Blemish—The fruits should show no imperfections whatever, such as worm holes, diseased spots, bruises, loss of stem, marks of handling, shriveling, etc.

7. Quality—In those cases where the quality of a fruit is judged, the specimens should be mature, having its flavor fully developed and the flavor should be typical of the variety.

8. The number of specimens on a plate must conform to the rules of the society giving the exhibition; any plate not so conforming should not be judged.

COLLECTION JUDGING.

Choice of varieties	15
Score of individual plates	85

Same rule shall apply to collections as far as possible as to individual plates.

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In scoring collections if the judge wants to be exact all plates in a collection want to be given an individual score. These scores are to be added together and the sum divided by the number of plates, thus giving the value of the average plate. Multiply the value of the average plate, scored on the basis of 100, by the value given individual plates on the score card and divide the sum by 100.

Sample score card after using:

CLASS 11. APPLES. ENTRY 5.

	Perfection.	Score.
Form	15	12
Size	25	20
Color	30	20
Freedom from blemish	30	28
	100	80

COLLECTION.

CLASS 1. APPLES. ENTRY 1.

	Perfection.	Score.
Choice of varieties	15	10
Score of individual plate	85	70
	100	80

FORESTRY FOR ILLINOIS.

DR. T. J. BURRILL, UNIVERSITY OF ILLINOIS.

Forestry for Illinois is a very different proposition from forestry for Wisconsin or for Nebraska, or for the United States as a whole. We must work out our own salvation. There are indeed lessons to be gathered from experiences elsewhere and there should be a good many of them and they should be turned to good account, but we can apply nothing without careful and wise consideration and usually can adopt nothing without readjustment or modification.

The reason for this is evident to the members of this Society. With the possible exception of Iowa, there is no State in the Union that has so small a percentage of its area that can be called waste land or land not suitable for remunerative agriculture. On the other hand there is no similar area anywhere better suited to the growth of a wide variety of useful trees. If we should not advocate the plantation on a large scale of trees for timber, it is not because

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there is any direct difficulty in the way. Success is assured if trial is desired. There is not an area in our State, not covered with water, which may not bear useful trees. The nearest exception to this is in regard to a few limited areas of nearly pure sand where vegetation of any kind is now very scant, but these areas are small and it is even probable that upon them some trees may be made to thrive. If, therefore, we do not urge extensive plantations for timber, it is not because important and very valuable kinds of trees will not grow thriftily in our soils and under our skies, but because the land is more useful for something else.

There is not an acre in Illinois left unsold by the general government, there is not an acre for which the title has passed to the State for non-payment of taxes. In other words, every acre of the 35,800,000 included within our boundaries is owned as valuable property by private persons or public organizations. Of this 35,800,000 acres there were in 1900, according to the United States census (12th) 32,794,728 acres in farms and worth, without buildings, $1,514,113,970, or an average of $46 an acre. From this average the price ascends (again without buildings) and for ordinary farming purposes purely, to as much as $200. For certain crops even this latter figure is to be multiplied by five or even ten, though at these prices the areas are of course small.

Compare this with Michigan having all told 36,755,000 acres in the State and in farms only 17,561,698 acres valued at an average of $24 an acre. In Illinois 91 per cent, in Michigan 47 per cent of the total area is in farms. What may be called improved land (a rather vague term) foots up in Illinois 88 per cent, in Michigan 32 per cent. That is, only about one-third of the total area of the State of Michigan is under cultivation, inclosed in pastures and meadows, used for roadways, town sites, etc., all put together, while two-thirds is still untouched by man or by him stripped of its native product and abandoned. Most of this area still in the wild, but owned by individuals or companies, is timber land. The entire woodland, including that in farms, constitutes 67 per cent of the total area, against 18 per cent in Illinois. The timber lands owned by lumbermen was in 1900 valued at for Illinois $813,790, and for Michigan $28,390,184.

From all this we may gather that there is in Michigan today a very large timber interest to be safeguarded, and there are very wide areas which should be reforested. In Illinois there are comparatively small investments in timber lands as such, and also small areas upon which profitable farm crops cannot be grown. It is

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altogether a different proposition to practice forestry operations on land valued at from 50 cents to $3 per acre and upon land worth from $20 to $200 per acre.

If we push our comparison of Illinois and Michigan as an example further, other differences quickly develop. There are no coniferous forests in Illinois; a very large portion of Michigan's extensive forests are of coniferous trees. The latter are seriously exposed to destructive fires; hardwood forests are rarely much injured by fire. There never has been a forest fire in Illinois of serious character, while in Michigan destruction has been frequent and enormous. Again wide areas in the latter State are very sparsely settled and therefore the problems of protection are different from those which must most prominently appeal to us. The fact of the enormously greater coal fields in Illinois decidedly affects the question, and the kind of manufactures which have developed, with or without close connection with local natural resources, also modifies profoundly the problem. Grand Rapids, Michigan, is known throughout the country everywhere for its furniture manufactories, yet the wood supplies are mainly from outside of the State. It makes a world of difference upon the forestry side whether a few hundred men are engaged in the making of paper pulp or in the use of this substance in printing newspapers, and so generally the special activities of the people must have prominent consideration in providing for their needs.

This comparison between the forestry problems of Illinois and Michigan is simply an example. It would have been just as striking if Wisconsin or Minnesota had been chosen and also the same, but in a very different manner, if Nebraska or Kansas had been selected. There is a greater similarity of the conditions in Ohio, Indiana and Iowa with those of Illinois, but everywhere else in the Union we shall find, upon investigation, that their forestry problems contain very different factors from those of ours whatever the other agreements may be. Even in these exceptional States, marked differences exist. The difference in latitude of Iowa and the best forested portion of Illinois alone affects considerably this question in the two States. In Ohio there is practically no land, outside of the highways and town sites, not included in farms, against 3,200,000 acres in Illinois. In Indiana 30 per cent of the total area is now wooded against 18 per cent in Illinois. In 1905 the value of timber products (with the output of the commercial, but not custom, saw and planing mills included) was in Illinois $7,081,474; in Ohio $12,567,992; and in Indiana $14,559,662. The value of the saw mill products alone are put down respectively as $5,381,506; $11,423,391; and $13,987,856. The raw material for these outputs came from out-

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side its own borders, to a greater extent for Illinois than for the other States, so that for our purposes the difference is greater than that shown by the figures.

These are simply some of the differences which tend profoundly to modify the forestry problems in the different States, and which make it necessary for us in Illinois to investigate for ourselves and to meet in our own way the conditions confronting us. The matter of transportation modifies so immensely the value of forest products, that each section of the country has from this reason, if for no other, its distinct peculiarities and makes special studies necessary, though these studies must reach out into adjoining and sometimes into distant regions of the country, with the home interests constantly and primarily in view. If Minnesota can abundantly supply us with white pine lumber at a moderate figure, we may find it unwise to try to provide directly for ourselves. It may be wise policy to continue to depend upon Indiana and other States for hickory wheels and handles, but in any case the problem needs attack from our standpoint. It can never be anything but bad policy to count upon others exclusively to do our thinking or to provide ahead for our necessities. Forestry matters never will take care of themselves. If any forward movement is made there must be push somewhere. If the best thing is to be done, the future as well as the present must be taken into account, and the distant future at that. No one else can do it. No one else will care to do it. We must.

But let us not, from comparisons with other localities or otherwise, suppose we have little to do. Other States have much greater forest areas and they have in some respects, each of its own kind, greater problems to solve than ours of these kinds, but whatever there may be elsewhere we do have big interests at stake of our own kind, and it is high time we were looking after them. It has just been cited that the Illinois saw mill products alone amount to more than $5,000,000 annually, and no one will suppose that this represents anything but a very small fraction of the total financial sums concerned in this reckoning. Illinois no doubt leads every other State in the Union in the amount of wood consumed. The total sales from the lumber yards amounts to a prodigious sum. There are in an absolute count more houses mainly constructed of wood in our State today than in any other one of the States. We certainly use the greatest number of railroad ties and probably the greatest amount of wood for fences, and must come near the maximum in the total wood consumption for packing boxes and barrels, while our manufactures calling for wood of various kinds and

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grades are rapidly gaining in magnitude of output upon dimensions seldom equaled elsewhere. It may be surprising to learn that Illinois has the largest investments of any of the States in the manufacture of veneers, which include thin stuff for fruit boxes and baskets. Illinois still leads in the cut of black walnut veneers, and is fifth among the States in the total value of planing mill output. It is interesting to note that in our State the total value of lumber manufactures has steadily increased during the last fifty-five years. Here are the figures from the U. S. Census reports beginning with that of 1850 and ending with a special census of 1905: Capital invested—1850, $41,446,364; 1860, $74,530,090; 1870, $143,493,332; 1880, $181,186,122; 1890, $397,861,928; 1900, $400,857,337; 1905, $517,224,128. Value of products—1850, $60,413,187; 1860, $196,715,856; 1870, $210,159,327; 1880, $233,268,729; 1890, $437,957,282; 1900, $555,197,271; 1905, $580,022,690.

This includes, let it be understood, work upon raw materials obtained out of, as well as within, the State, but it still lacks much of showing the total lumber trade.

Another item which shows perhaps more clearly what financial amounts are involved is that concerning railway cross-ties. In 1905 there were cut in Illinois 676,840 ties which as stumpage must have had a value of something like $169,210. But there are in use for the 11,000 miles of railroad track in the State about 20,000,000 cross ties. On the assumption that these require replacing each ten years, it follows that 2,000,000 are annually consumed. That is, there must be annually brought in about 1,323,160. These at a valuation of 50 cents each (ready for use) means a yearly expenditure of $661,580 above our own present resources.

It is more difficult to get at anything like a near estimate of the number of fence posts in use or annually required, but the figures are tremendously large. The average farm in Illinois consists of about 120 acres, and there are 264,150 of them. Now many of these are entirely inclosed with border fences and are more or less subdivided by cross fences. While in numerous instances the outside fences have been removed or perhaps have never existed, it seems that one mile of fence is not too great an estimate for each farm, and 320 posts not too much for this mil—enough to inclose simply 40 acres. On this supposition, which is nothing more than that, there are in use today 84,558,000 fence posts on the farms of Illinois, to say nothing of those along the railways and in the towns. If these need renewal every ten years there are annually required 8,455,800 for replacement besides those for any new inclosures. Valuing these at 15 cents each we have an annual cost of $1,268,370.

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Our own forests are not now nearly meeting this demand. There are large importations at much higher figures than have been named, and as things are, the supply must more and more come from outside the State at constantly increasing cost.

What shall be said of telegraph and telephone poles, the number of which in use is yearly increasing, and the cost, rapidly advancing? No attempt is here made to estimate numbers or values, but both are enormously large and not likely to be overlooked in counting up our need in this respect. So of mine props, and when one remembers the wonderful coal fields of Illinois, and their present and prospective unequaled outputs this call upon the forests must also compel solicitous attention.

If it is desired to obtain an idea of the growing scarcity of the most ordinary grades of timber in our State, let inquiry be made of the apple growers and apple packers concerning the price of loose barrel stock now, in comparison with that of a few years ago. We are importing much of this material and the supply is evidently becoming inadequate to the demand. A barrel famine has occurred several times of late, and is still more likely to happen next year and for the years to follow. As for tight barrel stuff, Illinois cannot now supply a hundredth part of the needs of Peoria alone.

If we follow out in this way all the needs of forest supplies for buildings and manufactures, for fuel which is still a large item, for the other numerous uses for wood and forest products; if we stop to consider how necessitous we are and how vital to our well-being these supplies really are and must continue to be whatever substitutes are found, we shall surely agree that the time has certainly arrived when these matters must have attention and that our responsibility here and now hangs heavy upon us. It will not do longer to say that Illinois can afford to let other States less favored than ourselves from the agricultural standpoint furnish our needs in this respect. We do and shall need their surplus, whatever may be done to help ourselves, and it does and will immensely concern us as to what they undertake and as to how they succeed. We are interested well-wishers concerning forestry movements in Michigan, Wisconsin and Minnesota; in Arkansas, Tennessee, and Georgia. We must strike glad hands with the Forest Service of the United States and with voice and pen must support enthusiastically the vigorous efforts of the chief executive in his timely and effective leadership in the preservation and wise utilization of our natural resources. It is indeed a matter for congratulation that we have one so alert, so keenly alive, and so heroic in action concerning such matters as we now have in hand affecting

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the present and permanent interests of the whole people. No president before him ever gave forestry prominent mention in a general message to Congress, but it was not omitted in the timely document you have just read.

While Illinois must work out her own salvation, perhaps with fear and trembling, lest bad mistakes be made, it does help any cause to have others elsewhere at work along similar lines. Whether there is direct transfer of thought from individual to individual is still debatable, at least in some quarters; but we know that men do absorb in perfectly understandable ways the ideas and reasonings of others, that opinions are reached and actions are stimulated because of opinions and actions elsewhere. Fortunately for us and for our subject, the air is full of forestry propaganda from Maine to Oregon and from Wisconsin to Louisiana. A well formed procession is under way. We have but to rally our forces and join the hosts already in vigorous movement. It is really easier to go along than to keep still.

There are now five well organized schools of forestry in the United States and a score of colleges and universities have cources of instruction all tuning out men having technical information and high enthusiasm for professional work. There are state forestry leagues, societies, or associations in twenty States, and there are more than as many other organizations giving primary attention to this subject. There are nine States that have State forest reserves, and others are soon to establish them. Twenty States make direct appropriations for, and six others support, forestry; and the twenty have each salaried forestry officers, mostly with no other duties attached but sometimes they act also in other capacities, as State geologists, fish and game wardens, or superintendents of irrigation. The area of the national forest reserves has steadily increased of late and now includes about 130,000,000 acres, or three and two-thirds times the area of Illinois. Great advance has been made in the management of these reserves, and objections made by parties otherwise interested have been largely overcome. They are now yielding a gross revenue of $1,000,000, and are self-supporting. They will soon be a source of considerable net income to the national treasury.

Private forestry, too, is making rapid advance. The great lumbering companies are employing trained men to manage their holdings and to direct their operations to the end that permanent interests shall be best enchanced. Nothing shows the trend of things in these directions better than the fact that men are offering their services as professional consulting foresters and are getting

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plenty of business. Large firms are organized as contracting foresters for the management of great wooded areas and for conducting cutting operations under methods best calculated to secure timber renewals. Farmers, too, are giving more and better attention to the matter of the planting and care of utility trees as well as to the better preservation of existing woods. They are calling as never before for information and instruction, and are studying for themselves their own problems beyond anything previously known.

Mention so far has been made only of forests for timber supplies. Other values are sometimes greater than these, and some of these other values are common to all forests. All forests serve useful purposes in relation to water and to soil, and also have an influence upon general climatic characteristics and upon the general physical well-being of man. They promote healthfulness and furnish comforts for those that live within their "sphere of influence." They furnish pleasures and are aids upon the esthetic side of life. "The groves were God's first temples" and often today the purest shrines are beneath overarching trees. We do not forget these things when urging the study and practice of forestry for supplies of wood now and for the future; all is included, but further elaboration here is impossible, if it were needed. It is not necessary, certainly not for the members of this Society. All appreciate trees; all recognize the general importance of preserving and improving forested areas and of planting and caring for trees on the farms, on the streets, in the parks, and about the homes. All are ready for the question: "What is the first thing to be done in Illinois in promotion of the subject?"

I take it no one pretends to know just what may best be done or just how best to do it by State authority and command. There are things of the utmost importance elsewhere which we know need not be considered much with us, and there are things we think should be done in Illinois which do not so prominently appeal to other people.

The State Horticultural Society has earnestly and efficiently studied the local questions and has been instrumental in a wonderful advance in tree planting affairs. Its half-century of life and voluntary activity has produced results which no man can properly inventory. Its records can be seen and read of all men outside of the printed transactions of its meetings and plainer than in the reports of its committees. Illinois owes a debt of gratitude, as well as for financial values beyond the biennial appropriations, to the State and sectional associations that have been so largely instrumental in beautifying the landscape, in adorning the homes,

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in enriching the orchards and gardens, and in educating and elevating the taste of its progressive people. More or less directly through these influences there are said to be more trees now growing within the boundaries of the State than there were when first the white man set foot upon its territory. Whatever the truth may be in this matter, the members here will be first to urge something further for the State and by the State under the distinctive name of forestry, something that shall bring forth worthy contributions to the general movement in all the States and something that shall enhance the special present and future interests of our own favored commonwealth. There is in this a State problem or State problems; it is State business; it concerns State pride; it appeals to State policies, and must affect in no meager measure State revenues. No civilized community can ever afford to neglect a matter of such wide reach and such recognized importance, and Illinois surely must not now fail both to see the responsibility and to undertake adequately to meet it.

A glance at what has been done should help to open the way for suggestions as to what ought further to be undertaken. If we confine ourselves to direct legislative action the story is very soon told for Illinois. The words forest and forestry were strangers in the wording of Illinois laws until very recently, and they have seldom been used at any time in bills that have become laws. The State has never appropriated a penny for specific or direct forestry interests. It is true that townships and counties have been authorized to raise and to pay out money for the purpose of encouraging tree planting. Among the authorized powers of town meetings is one whereby "The electors present at the annual town meeting shall have power: * * * To offer premiums, not to take such action as shall induce the planting and cultivating of trees along the highways in such towns, and to protect and preserve trees standing along the highways in such towns, and to protect and preserve trees standing alone or on such highways." On July 1, 1874, "An act to encourage the planting and growing of timber," became effective and made it "lawful for the board of supervisors or county commissioners' court [board of county commissioners] in any county in this State, to offer a bounty to any person in said county, who shall hereafter plant one or more acres of land with forest trees and properly cultivate the same for three years, any sum not to exceed $10 per annum for three years for each acre so planted and cultivated. *Provided,* that trees so planted shall not be at a greater distance apart than ten feet each way."

To carry this into effect the supervisors (or board of county commissioners) must by proper resolution offer the bounty and

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publish same in some newspaper at least three weeks prior to the first day of April of each year, and claimant must make satisfactory proof of his compliance with the terms of the act. Then the county clerk must issue to claimant a certificate for the amount.

The Governor is required by law to designate annually a day called Arbor Day to be observed for the planting of trees and shrubs, which requirement the executive has observed and sometimes his recommendations have been heeded by others.

In 1903 our Senators and Representatives passed a joint resolution requesting the Department of Agriculture at Washington to make an investigation of the forest conditions in Illinois and to report to the Governor. This request was to some extent complied with.

Finally, in 1905, an act was passed authorizing the formation of forest preserve districts in the State of Illinois, and making possible for the voters in a given territory to organize and support by taxation upon themselves such forest preserve.

This, with the exception of penalties for injuring or destroying trees or shrubs, recites the legislative action in our State which in even semi-direct ways concerns forestry or anything closely connected therewith. Notice nothing calls for money from the State treasury. The State has been willing that its citizens should do something to help themselves and has so far favored its own preservation. It has been ready to ask for help from the general government with results which must be considered worth while because the best study that has ever been made of Illinois forests and forest conditions was made in response to this request. That the work accomplished is entirely inadequate in its own line to the needs existing no one would assert with more emphasis than the officer who was in charge or than would now the Forest Service of the United States.

Ohio has recently established a Department of Forestry under the direction of the Board of Control of the Agricultural Experiment Station. The duties as defined by law are as follows:

"It shall be the duty of said Board of Control to inquire thoroughly into the character and extent of the forests of Ohio; to investigate the causes of their waste and decay; to conduct investigations in the several sections of the state in order to determine the species of valuable trees best suited to grow on the various kinds of soil of the state; to ascertain the cost and best methods of propagating, planting, cultivating, and managing woodlots and

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plantations on the various kinds of soil; to determine by investigation the average rate of growth of the various species of trees and the relative value of the various kinds of timber for commercial and domestic purposes; to conduct experiments in the treatment of the various kinds of wood for the purpose of increasing durability; to determine by experiment and investigation the kinds of trees and shrubs best suited to the various situations for windbreaks and shelter, for beautifying grounds, and the best methods of planting and managing the same; and to determine the needs for the preservation, improvement, and development of the forests of the several sections of the state."

It is further made the duty of the Board of Control to cooperate with the United States Department of Agriculture in such forestry investigations and experiments as may be agreed upon, and a provision is made that the expenses incurred in such cooperative work shall not be greater to the state than that contributed by the United States.

No salaries are specially provided for, but the experiment station receives certain sums annually for the purpose of carrying the duties into effect. Under these provisions the station propagates and distributes free of cost to farmers and others thousands of forest tree seedlings under special rules concerning their care and reports upon their growth, etc.

A professor in the State University (distinct from the Experiment Station) has forestry as a special subject of instruction.

Indiana supports a state board of forestry with a secretary who acts as state forester, and there is a small forest reservation, about 2,000 acres, obtained by purchase and managed by the board as an object lesson in forestry procedure. The board consists of five members, four of whom have each a small stated sum as compensation, and one (the secretary) a salary for which he devotes his whole time. The expenses of the board and the reservation are provided for from the state treasury and the printing is at state expense. The office is in the State House at Indianapolis.

These citations from Ohio and Indiana have been selected because the forest conditions in these states most resemble those of Illinois. Very much more attention has been given the subject in Michigan, Wisconsin and Minnesota than in others of our neighboring states, but while their conditions are similar among themselves, they are very different from those with which we have to deal. We surely can learn something from their elaborate arrangements, but should not try to follow without much modifica-

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tion their plans or expenditures. Iowa has established a professorship of forestry in the State Agricultural College, and has recently passed a law by which areas suitably planted with forest trees and managed after prescribed regulations are taxed at a valuation of only one dollar an acre until the product becomes available as proceeds. This is an attempt and apparently a desirable one to exercise state control on private plantings, a thing which the Ohio people have tried to secure in a very different way. The subject of taxation of forest lands and woodlots is one demanding the best possible solution, and any careful studies and experiments in that direction are necessarily important ones.

Perhaps these citations are, for our purpose, most useful in showing there is something doing, that even in states in which the forest problems are of least comparative magnitude they are recognized as important, and specific state action has been taken and work is in progress under such state authority and support. Illinois need not do things because other states do them, but in this case we must recognize our own needs and must, as an intelligent people, make provisions for our own present and future interests.

What are the needs as can now be seen? At least three things can be seen: (1) The facts as they exist should be ascertained; (2) the best methods of procedure should be worked out; (3) instruction and advice should be given.

There is required for the first a complete forest survey of the State. This must include not only a study of existing trees and woods, but must include related matters connected with the soil, surface characteristics, water, transportation facilities, markets, and social relations. Then related studies are demanded upon the character and magnitude of present and future needs and upon the possibilities and feasibilities of supplies. We have now nothing but piecemeal knowledge and unbased estimates to rely upon. We suppose one thing is about true, and infer that another holds to the first some kind of ratio; then fix up one or more other things the same way, take the average and reach a conclusion. This is not business. If conclusions are important surely some better way of reaching them is necessary. A state forest survey broadly planned and faithfully executed is needed and needed badly, and needed soon.

Proper attention to the first of our three requisites will help the others. Critical studies upon what now exists will aid in determining what can be added and how best to do this. A thoroughgoing study, for instance, of the burr-oak or catalpa in nature

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or in present plantations will be of prime importance in trying to determine what plantations should or should not be made considered in relation to situations and needs. A forest crop requires a long time to mature. Mistakes are fatal. Individual farmers, estate managers, mine owners, etc., cannot be expected to know or to be able to find out what to do and how best to do it. No one can understand how to grow trees, how to manage woodlands, how to fight diseases and enemies, how to shape profits and the like by intuition. If he is to find out what can be done and what should be done he must get it by sufficient study in kind and quantity, and this means professional preparation and application; it means wide observation and keen-sighted experiment. If the blind leads the blind both will fall into the ditch. Here, if anywhere among men, the leader must have his eyes open. There must be a state forester, under this or some equivalent name, whose whole time and ability, properly assisted by subordinates, shall be devoted to the subject in our state.

All this means technical research. It means practical study and scientific investigation. It means trained experts and it means an abundance of hard, though of interesting, work. But it is only an aid to or means by which our third need is to be met. The knowledge gained must be made known. Information must be distributed. Publications must be issued. Sound advice must be given when called for, and as special conditions affect results inspection trips will often be called for. Large correspondence will be necessitated and provision should be made for addresses before public assemblies and club meetings, for lectures and demonstrations at farmers' institutes, at agricultural fairs, and at educational gatherings, for communications to the public press, and for other means of disseminating information and for engendering enthusiasm.

Then formal instruction should be provided for students looking forward to rural life and at least offering a chance for others to gain acquaintance with the general principles of forestry and the importance of the subject in national life.

In attempting to provide for these three divisions of the general subject no personal or political or any other extraneous interests are to have place or influence. The "good of the cause" must be and must be alone considered, but it is real wisdom to bring in any help from any and all quarters. Undoubtedly there may be help which may and should be secured. As long ago as 1885 a state law pertaining to the State Laboratory of Natural History included this paragraph, to-wit: "It shall be a further duty of

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the director [Professor Stephen A. Forbes] of said laboratory to conduct a natural history survey of the State, giving preference to subjects of educational and economic importance." Here is authority sufficient to cover, if so ordered, the first of the points above enumerated. Then as previously noticed the national department of agriculture has been formally invited by legislative joint resolution to make investigations to this same end. Possibly further aid in this way may be obtained for the asking, and if so should be thankfully accepted. The work already under way having state support, of the survey of soils and that under the director of the state geological survey may be utilized, and perhaps to very decided advantage, and possibly other aids may be secured. If some of this can be made effective at once without waiting for legislative action, so much the better, and this is not altogether improbable. But the main work outlined under the second and third of our divisions must be by technically qualified men permanently employed and sufficiently supported on the financial side to make their work effective. Some further state aid must be asked and ought to be granted. No possible makeshift can take the place of an appropriation. There has been enough temporizing heretofore. Now the call is imperative and only one response will suffice. For a time $10,000 a year should be made available; perhaps the amount may be less after the work scheduled under our first division has been well attended to; possibly more will be required as things develop. While there can be no immediate financial return, there can be no sink-hole, the fear of which should delay action. Ultimate rich compensation for present sacrifice is assured. And it is not much of a sacrifice either. One-thirty-fifth of one cent an acre, or two mills a person per annum, will provide the money. Will this company shoulder its proper share? Will each of you agree that the state shall oblige you to pay in the shape of taxes one nickle every twenty-five years that necessary forestry business in Illinois may be prosecuted, and that your children and children's children may not justly accuse you of short-sighted avarice or woefully mistaken economy?

Forestry for Illinois means forestry for all the people of Illinois, not for some special group or those of some special vocation. Whoever lives in a house, whoever needs artificial warmth, whoever uses a chair, whoever travels on a railroad, whoever crosses a bridge, whoever rides in a boat, or whoever needs food or enjoys landscapes, is interested, or should be interested, in the subject here discussed, and this interest in its close touch and wide reach is a growing one, a vital one to us and will be to every one who comes after us as an inhabitant of our magnificent commonwealth.

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DISCUSSION ON DR. BURRILL'S PAPER.

THE PRESIDENT—That is one of the most elaborate, interesting and able papers I have ever listened to in regard to forestry.

MR. AUGUSTINE—It is very evident that the reading of this paper has created a good deal of forestry spirit among us and I know of no society in existence in Illinois upon whom the responsibility of moving in the direction that the Doctor refers to in order to bring about some action devolves upon more than upon this Society, in fact, I think that we rather look to this Society to do this. In view of that, I move you, Mr. President, that a committee of three be appointed to whom this paper be referred and report later in this meeting, so that we may take some definite action in this matter before we adjourn.

Motion seconded.

MR. PERIAM—I have been at work on this forestry question for fifty years in Illinois. There is more timber in Illinois to-day than there was fifty years ago, because there has been a great deal of timber planted and this Society is the Society that always has stood behind the work done in planting timber. The Northern Illinois Horticultural Society, when a part of the Northwestern Fruit Growers' Association, before this Society was born, was interested in forestry, but you never can get the farmer to plant trees unless you can show him that that planting is going to be profitable. You cannot get any man to plant trees and take care of them with the view that they are going to be of value to his posterity, because he will tell you that posterity never has done anything for him.

I have spent a great deal of time in investigation and especially forty years ago. One thing that was first brought to my mind was the destruction by floods in the Ohio River from the cutting of the timber from Pennsylvania, and the States around the headwaters of that very destructive stream, and I as editor of the Prairie Farmer and for my own satisfaction made some investigations in the matter. About forty years ago, I think it was, the Government of France appointed a commisison of the most eminent men in geology and soil to report what portion of the land of the Empire, which it was then, should be in timber to reach the best results in general agriculture. Their report was that with one-fourth of the land in forests in France, the three-fourths that were remaining would produce more than all the land without forests. I was appointed to look up the question and study it. My side of the question was this: If one-fourth of the surface of a country in forests would better the condition of the remaining three-fourths,

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if the trees were properly distributed a very much less area would be necessary than in the former case, and I came to the conclusion that if 100 acres of land in the State of Illinois had ten per cent in forestry, that better conclusions would be reached as to the balance of the land than was found in France. Now, there is nothing more profitable upon land adapted to tree-growing than the production of forestry in this day. I think what we ought to do and what the committee should look at earnestly is to obtain such information as to what varieties of trees should be planted as successions of crop, from the pole crop up to the more valuable crop. I was very glad to hear this paper, it is an epitome of the most valuable things pertaining to this question.

PROFESSOR GRAHAM—I agree with the speaker in saying that there would not be much use in urging the average farmer to-day to plant trees; but the paper, as I understand it, looks toward the education of the people of Illinois. A few years ago there was no need of saying to the fruit grower "Spray the trees;" but to-day no fruit grower expects to grow good fruit without spraying. It is a matter of education. It is not likely that we shall get farmers to take up $200 an acre land to plant trees, but there are thousands of acres here in Illinois where farming cannot be done, that is well covered with timber, and that timber is being absolutely destroyed, wasted, and that land rendered almost useless. It is hardly worth anything for anything else, where it might abound in trees that in a few years would grow into good timber. We can teach people that that land, by clearing out the underbrush, can be left with as fine trees growing and with blue grass growing among the trees, making the very best pasture in the country and still have the forests going on. There can be a great deal done even among our farmers in Illinois by the right kind of education.

COL. MORRISON—In 1852 I listened to a remark made by a gentleman that lived on the main line of the Illinois Central railroad. He was present at the laying of tracks to build the railroad, and he said, "I can get onto my horse and ride a full week on the proposed line of the Illinois Central railroad, and I will not see a man, nor a house, nor a tree, nor any living thing unless I chance to see a groundhog or a prairie wolf. Now, you gentlemen are proposing to build a railroad over that wilderness. There never was a wilder scheme entered into the brains of man than that." Under the agrarian act, that land had gone down decade after decade, until it was offered to the public at twenty-five cents an acre and they did not want it because they could not go from the divide between the Wabash and the Mississippi to the timber and back the same day, and therefore that land was uninhabited and uninhabitable.

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To-day that land is worth $200 an acre and you are not out of sight of timber as you travel over it from north to south; groves have been planted and sprung up and abundant shade for cattle and pastures. Mr. President, I do not say that, to discourage any man from planting a tree, for it is the grandest work that a man ever engaged in. Dean Swift was once asked what were the four cardinal virtues of man. He answered, "Plant a tree, build a house, write a book and father a child." Now, many of us can plant a tree that cannot write a book, but then we can divide this thing up and let Dr. Burrill write a book and write a magnificent paper such as he has read here to-day and some of us, if he will help us out, can plant a tree and do something for the grand old State of Illinois. I have a feeling of almost hostility come over me when I see a man put an ax to a tree. I have about 500 acres of woodland. I drive into the midst of it in summer and stop my horses and listen to the singing of the birds. Once in a while I get a glimpse or hear the voice of what is called the hermit thrush, the most beautiful strain of music that my ears ever heard. They are a very shy bird, but after a while, if you drive into the midst of a forest and keep perfectly still, that note of triumph will come to your ear. When I look out on this campus, when I look on this avenue, that has received the name of Dr. Burrill, I think no finer tribute could be paid to a man who has beautified this campus than to have his name given to that avenue. I hope this question will be taken up intelligently and acted upon and if we cannot get any appropriation from the State, we can engender enthusiasm enough if we listen to such papers as have been read here so that every man at least once a year will plant a tree. I hope it will be done.

MR. RIEHL.--I simply wish to say that we can plant trees in certain sections of this State and get benefit from them and good paying returns long before our grandchildren will be here. I refer in my own locality, for instance, to the black locust. In some sections of this State it is of no value, but in our section the borer does not trouble it. It is a rapid grower and makes timber in a short time, timber of the highest value so far as resistance to decay is concerned. I have a grove that I think is about seven years old of trees that will make small posts and will make grape stakes that will last longer than I will, and aside from that, the flowers of the black locust are among the finest bee foods that I know of. The honey locust is of no value, but the black locust with us where it succeeds is a tree that can be transplanted and give good returns in timber and also in honey food.

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DR. FORBES—Before this motion is put, may I say a few words? In the first place, I want to say that this a great meeting of the State Horticultural Society. If we were to adjourn now it would be a record breaker. I think this paper is the beginning of a movement that will be remembered fifty to one hundred years from now. I remember at some similar meeting a good many years ago when a report was submitted by a committee of this Society on the subject of agricultural and horticultural experiment stations. We did not know very much about experiment stations. That committee searched the literature of Europe and this country to find out what an experiment station is, and the committee made a report, and while I may not say that that had very much to do with the creation of the sentiment which has resulted in the establishment of experiment stations here and elsewhere, nevertheless it was that sort of initial movement, a movement of initiation and the expression of general and enthusiastic interest on an old subject in a new form. Now, I want to tell you what we have already begun to do and what we would like to do to give this movement a little life in its beginning. It is one thing to get a tree and it is another to keep it; it is one thing to enjoy it yourselves and another thing to pass it on to children and grandchildren, as a great many of us have found out in the last twenty or thirty years. With the aid of my good friend Senator Dunlap and many other friends in the Legislature, I have undertaken to set on foot a means by which the people may learn how to preserve what they already have in the way of planted trees in their towns and on their premises and parks and lawns and along their streets and I have now an assistant whose entire time is given to this matter of insects and other pests on shade trees and ornamental trees in cities and towns—an assistant who is especially engaged for that purpose. He is spending most of his time in the city of Chicago, because that is where these problems are most urgent and most important, but likewise taking trips and giving advice in all parts of the State where insects or diseases are troublesome. I have a man engaged for another purpose, but he would be unavailable in such an enterprise as we are here contemplating, a man who has had long experience in every kind of forestry work, tree protection, work for the renovation of trees of which Dr. Burrill spoke, a man who had charge of the work for the whole State of New York for one of these large forestry parks last year. Now, we want to go into this field in two ways, first, to continue and amplify what we have done for the protection of what we have and then making use of the authority of the law to ascertain the area of land within the State which is adapted to permanent forest culture and which is not good for much else.

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COL. MORRISON—We have not much of that kind of land.

DR. FORBES—Some land adapted to permanent forest culture, select a small area and make an expert survey of it as to its present conditions, particularly as to the condition of the health of its trees, and the dangers which may menace any program of this sort; to secure, as there is no doubt whatever we could secure, the aid of an expert forester, an experienced man in this work from the United States Forestry Department, and make a little sample survey and have that select area or tract of ground down there; get that into trim for next fall with photographic illustrations and so give a little sample—on a small scale, it is true, but one which nevertheless would be a good illustration of the whole subject that we will have to go before the Legislature with next winter as an eye-opener with regard to what this whole subject means, and that can be done with no more authority than I have. I wish we had more money, but then we can save enough out of what was given us by the last Legislature by trimming here and cutting there and heading in there and get this movement on its feet.

MR. DUNLAP—I want to emphasize the importance of what Dr. Forbes has said in reference to the initial movement along these lines coming from an organization of this kind and also coming in such manner that that will be productive of the greatest amount of good. Reading the history of the Northwestern Horticultural Society, which comprised a number of states, I find that in those meetings originated a movement for the Board of Agriculture in the State of Illinois and the appointment of a committee to go down to Springfield to ask the Legislature to formulate a plan for the appointment of a Board of Agriculture in this State. I also find an initial movement for an agricultural education and practical education for the masses and that is where these universities started, way back in the early days of societies similar to this and in the minds of men who were interested. Now, I want to speak of the present state of this question, but you possibly know that at the beginning of the present session of the Legislature there was a bill introduced—several bills, in fact—that were referred to a committee on agriculture and horticulture, providing some sort of initial movement for a forestry board or [illegible]bout planting, or taking up the subject in one way or another, and some of the members were considerably interested, but as there was no concerted movement behind the program and there was no program that was carefully enough outlined to meet the approval of the committee in time for action—for that reason no action was taken, although favorable report was made upon it by some of the committees. So you can see how these things work out. I simply wanted to state

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that, showing the practical side of this question, that there must be some program of action along with the simple resolution and some one to present it to the Legislature.

MR. REASONER—We have an object lesson here which is a quarter of a mile long. Perhaps a large proportion of the members of this Society are not aware that there is such forestry on the University grounds just in sight of us here. I believe it can be demonstrated that forestry culture can be made profitable even upon this high-priced land. I do not know how long those trees have been planted there—I think about forty years—but to me it is the grandest sight in and around these two cities. You ought to go out and see that forest.

MR. BRYANT—I am wondering if some of the statements made here are not misleading in regard to the relative amount of timber that there is now in the State and that was here fifty years ago. I presume there is no question but what there are as many or more trees, but are they the trees that are as valuable for commercial purposes, for posts, for ties, for the various uses? Most of these trees have not been planted with reference to that, they are not a variety that are adapted to those uses and it seems to me that that statement going out without any qualification would be somewhat misleading. Perhaps I am wrong in that, but I think we want to turn our attention more generally to trees that are valuable for the various purposes for which these forests, these old timber plantations from which all the valuable timber has been culled, were valuable. I really would take exception to my friend Mr. Periam's statement about the service of these varieties. It seems to me that you cannot use a timber for posts, thin it out and get valuable wood for manufacturing purposes. Of course you have shade trees and a nice place for comfort and beauty, but not for the value of the timber.

MR. AUGUSTINE—I was afraid my motion was not fully understood. I meant in my motion not that a permanent committee be appointed to investigate this matter and perhaps go before the Legislature, but simply a temporary committee to report on this paper and put the matter in a tangible and practical shape so that we may have a report at the close of this meeting and perhaps appoint a permanent committee to act during the coming year. I think we ought to do that.

THE PRESIDENT—It was so understood.

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MR. PERIAM—I had reference to trees that were planted for shade and use, not apple trees, not fruit trees at all. Sixty years ago the fire swept through all our groves and there was no underbrush, but the upgrowing of that underbrush you can see now and you can now hardly get out of the sight of trees in Illinois, but you see the plantings of the farmsteads, they are the ones that have given the increase to what we originally had.

Motion to appoint committee was put to vote and carried.

PROFESSOR GRAHAM—I think we ought to place on the records the indorsement of this paper and I move you that we, as a Society, express our appreciation of the paper and our hearty approval of the sentiments in the paper.

Motion carried.

CONDENSED REPORT OF EXPERIMENT STATIONS.

W. R. SOVERHILL, TISKILWA.

The spring of 1907 opened with very warm weather, during the month of March followed with continued frosts and freezes during April and May. All tree fruits were seriously injured, only in occasional vicinities was there any fruit. The small fruits matured fair and light crops.

STATION NO. 1, PRINCETON.

The only apple tree bearing fruit was the Salome.

The Perfection and Wilder currants are gaining a place among recommended fruits.

The Ridgely Chestnut bore a fair crop; bear early, hardy, and their planting should be encouraged.

STATION 18, HEBRON, MCHENRY COUNTY.

Apple trees too young to bear, have made an excellent growth this season. Strawberries two weeks late in ripening.

With all the cold, wet, freezing weather, the Lombard, Wolf and Wyant plums matured fair crops.

STATION 16, DIXON, LEE COUNTY.

All plums and apples completely frozen by early frosts.

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Lincoln Pear—Never blights; small tree bore fair crop this year.

Strawberries were a good crop; little wet at fruiting season and some damage from frosts at blooming time.

Those showing up favorably this season are as follows:

Florella—Good foliage; stem fairly erect; little or no rust; season medium, fruit firm; promising.

Ekey—Large, conical, good flavor; firm; good foliage; color dark; ripens early; probably a good shipper.

Cardinal—Good foliage; very large, round, slightly conical; dark; firm; very promising.

Hummer—Very productive; firm, regular in shape; large, fair flavor; popular for a shipping berry.

Plum Farmer Raspberry—Strong grower; no sign of disease; very promising.

Iowa Red—Gives promise of value; berry extra large; quality good; late apt to crumble some.

Grapes attracting attention, viz.:

Wyoming Red—Bunch medium in size; compact; smaller than Woodruffs; healthy, vigorous; very promising.

Station No. 4, Savoy.

The heavy frosts during the time the trees were in bloom was a severe blow. Until after the June drop it looked as if there would be a half crop, but the drop took nearly everything.

The Ben Davis made the poorest showing. For a time after the bloom fell it looked as if there would be a fair crop of peaches, but the drop took them.

There were a few quinces. The apple quince yielded the best crop.

No plums this season.

Station No. 17, Scottsburg.

All tree fruits a failure. Most of the berry crops were fairly good.

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The *Autumn Strawberry* bore some fruit, but seems to be rather weak.

Pan American bore more fruit than *Autumn,* but is not prolific enough for a commercial berry. It is a good novelty.

Virginia is promising; has quality, fairly prolific, medium in size; will try another season.

McFarland Chestnut bore a few nuts of good size and quality; many burs not filled; trees quite young.

Nothing new in raspberries or blackberries.

Illinois grapes this season were the best ever had.

Extensive planting in apricots, cherries, plums, quinces, apples, pears and peaches this year. Also a number of new currants, blackberries, raspberries, strawberries and ornamentals.

Station No. 11, Olney.

On account of failure in tree fruits there is nothing to report. This year's stock in fine condition.

Station No. 15, Villa Ridge.

STRAWBERRIES.

All varieties discarded last year except Mrs. Miller and Roosevelt.

Mrs. Miller—An excellent variety for home and market; very large, bright red, very prolific; flavor very good.

Roosevelt—Bright red; flavor very fine, and is highly recommended for family, but is too small for market.

Fifty varieties strawberries planted this year.

GRAPES.

W. B. Munson—An excellent variety for both home and market, but a shy bearer.

Delago—An excellent medium-sized grape for home use.

Carman—Large, juicy, good flavor; good foliage; strong grower and very late. Excellent for home use.

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Eclipse—One of the best early grapes. Size and bunches about like Concord. Quality better than Concord. Highly recommended for home and market.

Hicks—Resembles Concord, but is both larger and sweeter, bunches more compact and vine more vigorous. Rots less than Concord.

Station No. 8, North Alton.

Less than half a crop of strawberries this year.

The following are varieties that did well:

Arlington—Perfect flower; resembles Bubach. Plant is large and vigorous; productive. Berry is finer and of better quality than Bubach. Recommended for planting.

Ekey—Perfect flower; strong healthy plant, and productive. Berry pointed, very bright, glossy color; firm and of good quality. This berry has shown up exceptionally well and brings the top prices. Highly recommended.

Beedler—Perfect. This seems to be the most promising late variety ever fruited at this station. Plant remarkably strong and healthy. Berry averages larger than any other sort ever tested here. Quality good and a good shipper.

Early Bird—Perfect. A seedling of Senator Dunlap, which it resembles, except that it is a little darker in color, firmer and ripens several days earlier, and better quality.

BLACKBERRIES.

Colorado—Best record of any sort tried at this station for many years. Large, jet black; very productive and fine quality.

RED RASPBERRIES.

Manitou—Very vigorous and very productive, being large and pointed; quality superb; very firm. Highly recommended for home and market.

Iowa Red—Very large in size; productive; good bright color, and of good quality. Inclined to crumble. Good sort for exhibition and family use.

Portage is the best gooseberry fruited at this station.

Perfection Currant best at this station.

Belle of Georgia the best white freestone peach tested at this station.

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GRAPES.

Eclipse—Ripens before Moore's Early and holds on wonderfully well; little smaller than Concord. Vine exceptionally vigorous and healthy.

Rochester the best chestnut so far. Two-year tree planted last April bore 19 perfect nuts.

STATION NO. 8B, ALTON.

APPLES.

Two Akin trees, one of the willowy type, and one of the upright habit, have shown marked productiveness for several years in favor of the willowy type. This variety has been showing up well and is recommended for that soil. However, in other sections it is inclined to be a shy bearer some years, but the fruit is excellent and brings the best prices.

Greenville is an early fall apple of excellent quality.

Ingram—Seedling of Rawles Janet, recommended for commercial planting.

Oliver (*Senator*)—This sort has fruited the past four years and is a beautiful large red apple of excellent quality. Season follows Jonathan. Recommended for planting.

PEACHES.

Carpenter Cling—Bore a good crop again. Season is September and always bring a high price. Recommended for planting.

CHESTNUTS.

Boone, Rochester, Ridgely and *McFarland* are highly recommended for planting.

WALNUTS.

Thomas has borne twice on grafted trees and believed to be one of the best native nuts.

GRAPES.

C. A. Green—Fruited for the second time, but so far it seems identical to the Niagara.

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RASPBERRIES.

Manitou—Fruited again this season and has proved to be the best red variety so far fruited. Very productive and of excellent flavor, and a good grower.

BLACKBERRY.

Ward—Very productive and good quality. Recommended for planting.

FILBERTS.

Thrive and bear well. Recommended for planting.

PECANS.

All southern varieties winter killed except Centennial and Bolton. Southern varieties not very promising for this section.

DISCUSSION.

MR. DUNLAP—I do not know whether this is just the time to bring this in, but I have an idea that I would like to present to the Society at this time upon the question of experiment stations. We are a society that is in the process of evolution, and those of us who have charge of some of these experiment stations know the difficulties under which we labor because they are more or less temporary in their nature. We organize a station, plant out the trees and plants, and it is reported on for a few years and the party sells out or dies, or something happens, and a large part of the work and expense of the station is lost to this Society. Now, is there any way by which we can better this condition, if there is, it seems to me we ought to do it. If we can have a permanent experiment station, at least have the station conducted on a permanent basis, it seems to me it would be of very great value, without discontinuing the stations that we have now. I have this suggestion to offer: Our secretary's office now, for example, is, it seems to me, altogether inadequate for the Society. We are paying a secretary a very small salary and as a consequence we can get only a portion of his time, and then he has to work a great deal more than he is paid for. We pay, I think, about $400 a year and, with other things, perhaps $600 a year to the secretary. That is a very small salary. In other states they have a state officer at the state capitol who puts in his entire time, devoting it to the interests of the society and promoting the interests of horticulture of the state. It

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occurs to me that if we could have a state experiment park or farm owned by this Society and the secretary in charge of that farm as superintendent of it, that we could pay the secretary double the salary that he is getting now at least and from that farm we could get returns that would meet that extra expense of salary.

I suggest as a sort of scheme for that, that we take a farm of forty or eighty acres in the fruit section of the State and with bearing orchard upon it twenty or thirty years of age of standard varieties and let that be taken care of in a model manner. Let there be at that station all of our experiments in spraying, cultivating, fertilizers, budding and grafting and whatever other things we might wish to try; let them be tried at this State experiment station in charge of the secretary and the secretary can give all his time to the interests of the Society. We can pay him enough so that he can afford to do it. He can move onto this place and let that be the Mecca for all the horticulturists of this State. If we want to find out things we can go there and see them in actual experiment carried on by the State. I have just outlined this scheme to you roughly. I believe it is capable of development. I would retain all these other station, I would have these other stations very largely for testing the new varieties that may be brought to our attention, and I will say right here that a great deal of the usefulness of these stations in the past has been the reporting upon these varieties, ninety-nine out of one hundred of them being undesirable, and it is the money that is to-day saved to the fruit grower in reporting upon these undesirable varieties that makes the experiment stations as we have had them valuable to the Association and to others outside. There are some details connected with this matter, but I just offer these suggestions to you. Can we not accomplish ten times what we are accomplishing with this matter of experiments if we proceed along a more permanent line? I feel the need of this in seeing the matter carried on at my own station and in other stations throughout the State. We have three members who are members of the committee of control, each one looking after the stations in his district. They have done the best they could under the circumstances, but I would say that I believe one visit a year is as much as any station has had from the committee of control, perhaps oftener than that in some sections, but I have not seen anybody around my station more than about once a year and they stay such a brief period of time that it is impossible for them to get information. This secretary could be put in charge of all the stations and he could have a diagram of the plot of every station that is carried on by this Society and know the name of every fruit and plant that is in that station and you would be able

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to get complete information with regard to the station and he would visit the station as often as was necessary through the year. Now, cannot we have more efficient service in our secretary's office in the development of horticulture in the State and more successful and valuable work in our experiment stations if we adopt some new line of policy different from what we have had in the last fifteen years since we instituted these experiment stations? I am not criticising them, I think they have done valuable work, they have all done the best they could, some of them have done better than others, but I offer this for you to think about. If there is anything in it, let us have it.

THE PRESIDENT—I am glad the Senator has brought this up. There is no question but what the experiment stations have done good and valuable work. Just how to make a change I think the members would need to think about it a little. It is entirely new to them and it may need a little thought before any action is taken.

MR. STANTON—I want to say for the information of the Senator and some others that there is a movement on foot somewhat similar to what he has outlined and a committee has been appointed and I presume something will come of it in the future. Just how soon the matter will be brought to action I do not know, whether it be entirely through this Society along the line that he suggests I cannot say at this time.

MR. PERIAM—The Wisconsin State Society pay their secretary $2,000 a year and they say he earns it. He is one of the professors in the university.

The President named the following committee on Forestry to consider Dr. Burrill's paper: Messrs. H. Augustine, R. O. Graham, J. Periam.

On President's Address: W. S. Perrine, F. D. Voris, A. J. Dunlap.

WEDNESDAY—EVENING SESSION.

THE FEEDING OF OUR TREES.

PROF. R. O. GRAHAM, BLOOMINGTON.

The first care of the Orchardist should be the selection of a proper location and proper soil; the next, selection of proper stock and suitable varieties; third, proper spacing and proper planting.

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After these preliminaries, the proper feeding of these trees must be his special study. No set formulæ or rules can be prepared to meet his special needs; for each variety of soil will have its own special needs, which intelligent care alone can detect and satisfy. And this care comprises the cultivation and feeding; for cultivation is but one form of feeding.

The subject chosen as the text of this paper is trite, and a few years ago would have been declared worn threadbare. But the years of the present times are years of progress, of experiment, or careful research. We are awakening to the realization that we are just beginning to know at many points where we supposed perfection had been attained. The needs of our trees and how to meet these! A whole skein of interesting problems, of vital importance to the fruit-grower.

Tree foods may be classed as natural and artificial. By the former we mean the foods already in the soils; by the latter, manures and commercial fertilizers. So long as there is an abundance of the former class, it will be wasteful and foolish for the orchardist to spend good money for the commercial foods, unless careful experiment may prove to him that it pays to do so. We contend that most soils used or likely to be used to any great extent for orchard purposes, except in a few isolated cases, contain an abundance of these food materials to supply the orchard for a century, without showing signs of exhaustion; and that one of the chief sources of failure in many of the orchards planted here, especially in Central Illinois, is that the tree has too much food; and, like an overfed animal, "waxes fat and kicks" against the burden of fruit bearing.

In order to establish a basis for argument, let us quote the analysis of an ordinary sandy clay soil, such a soil as is not well adapted to corn, but is the delight of the orchardist. I quote Professor Roberts, of Cornell University, who gives the average of 49 surface soils, these soils being selected by him as being average soils of the state, soils phenomenally low or high being avoided in the choosing. The figures show the amounts in the first eight inches of depth:

Nitrogen	3,053	lbs. per acre
Phosphoric Acid, P_2O_5	4,219	" " "
Potash, K_2O	16,317	" " "

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Analyses of ten subsoils from the same localities gave an average as follows:

Nitrogen	4,069 lbs. per acre
Phosphoric Acid	1,816 " " "
Potish	6,843 " " "

The analysis of our clay or sandy-clay soils of Illinois will not differ widely from the above figures. Our soils then are the great storehouse of food supplies; and the larder seems far from empty, even when the soils have been used for generations. The best-stocked larder will become exhausted, however, if too frequently and too severely drawn upon. Are our soils in danger of like exhaustion from orchard growing? To reply intelligently we must consider the demands made upon them by our trees and fruit crops.

Using Roberts again as a most competent authority, we give the amount of soil exhaustion by an acre of average apple orchard, 35 trees to the acre, in twenty years, after thirteen years of age, and with an average crop of eleven bushels per tree annually:

	Nitrogen.	Phos. Acid.	Potash K_2O.
The Apples	498.6 lbs.	38.25 lbs.	728.55 lbs.
The Leaves	456.75 "	126. "	441. "
The Trees (35)	283.15 "	107.45 "	264.25 "
Total Exhaustion	1,238.50 lbs.	271.70 lbs.	1,433.80 lbs.

Adding the average amounts of Nitrogen, Phosphoric Acid and Potash given above as found per acre in surface soils, to the amounts in average sub-soils, since the tree-roots penetrate both soils and feed from both, we have: Total food supply, N. 7,122, P. 6,035, K. 23,160. Total exhaustion, 20 years: Apples, N. 1,238, P. 271.7, K. 1,433. At this rate, 60 years of steady bearing, with an average of eleven bushels to the tree, would only exhaust half of the nitrogen supply, one twenty-second part of the phosphoric acid supply, and one-seventeenth part of the potash supply stored up by nature in the average soil suited for orchard purposes.

I do not overlook the danger of drawing false conclusions at this point. The analyses show only the presence and amounts of the food supplies; they do not show how much of these is available; in other words, how much is ready for use or can be made ready. Years ago, in my analytical work, I determined the portion of phosphoric acid that was in the form of phosphates soluble in warm water; the portion soluble in dilute acids; and the insoluble portion, pronouncing the latter "unavailable phosphoric acid." But we are

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learning better, and are coming to realize that through the agencies of nature and of life practically all supplies may become available. In reporting soil analyses today, usually only the totals are given, and no attempt made to divide into available and unavailable.

Further I am aware that we do not know at what point in the exhaustion process we may enter upon a condition where the food supply is insufficient to allow the tree to continue its full limit of production, and to maintain the standard of excellence in its fruits. We find the orchard showing signs of decline. But there may be other reasons than lack of food supply. The food may be there; but is not being "cooked" fast enough. The answer to the question whether or not soil exhaustion is accountable for the decline, and whether or not we must guard at this point, can be answered only by carefully-conducted experiments running through many years. Fortunately just such an experiment has lately been reported by Professor Hedrick and his assistants in the work of the N. Y. Experiment Station; a report that doubtless most of you have seen, but which is germane to our subject, and is well worthy of quotation.

The soil of this orchard or rather similar soil in an adjoining field, is a heavy clay loam, twelve to eighteen inches deep, resting on a still heavier clay, giving an analysis about as follows:

In eight inches of the soil:

N 5,599 lbs. per acre.
P 2,479 lbs. per acre.
K 23,733 lbs. per acre.

Evidently the soil was only an average orchard soil, certainly no better than the great majority of such soils. On this soil was an apple orchard, forty-three years old when the test began; and the test was continued through twelve years; the orchard at the close being fifty-five years of age. When the experiment began, the orchard was in sod, this being in 1892. The object of the experiment was to note the effect of fertilizer application on yield, on quality and on color of the fruit; also to study the effects of cultivation and of cover crops.

During six of the twelve seasons various clovers were sown and plowed under; one season oats; one season oats and peas; one season rye and another barley. Throughout the test, thorough cultivation was kept up over the entire orchard. Alternating plats were selected, half of which received during the test no other treatment than cover crops and cultivation. Throughout the period,

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the treated plats were given 100 pounds of wood ashes per tree per year, excepting during 1901 and 1902, the ninth and tenth years. As these ashes contained about four per cent. of potash, each tree received about four pounds per year, or forty-two pounds during the twelve years, equal to 2,031 pounds per acre. The first five years this was the only applied fertilizer. Besides the potash, this treatment added something like seventy-two pounds of phosphoric acid and 1,500 pounds of lime per acre annually. Beginning with the sixth year eight and one-half pounds of acid phosphate per tree was added for the seven years; the forty-eight trees on the acre receiving 408 pounds annually. The phosphate was guaranteed to contain fourteen per cent phosphoric acid; or an average of actual phosphoric acid of fifty-seven per acre. The usual recommendation is for from thirty to sixty pounds of this per acre. Both ashes and phosphate were scattered broadcast in the spring, over an area slightly greater than that covered by the tree branches.

Now for the results; and only a brief summary can be given here. Of the five varieties in the orchard, Roxbury and Northern Spy showed a fair gain in yield on the treated tracts over the untreated; Fall Pippin, a small gain; Baldwin barely held its own; and R. I. Greening showed an average *loss* of 16 bushels per acre through the twelve years on the treated tracts over the untreated. Naturally all tracts increased decidedly in yield over the yield before the test began; and both treated and untreated tracts yielded more liberally the last six years of the test than during the first six years. Throughout the 12 years, the average yield per tree was 8.69 bushels for the treated and 7.45 bushels for the untreated trees. On a five acre orchard, this would be an annual gain of about 99 barrels, counting firsts, seconds and culls. At $1.00 per barrel net for all grades as an average through the twelve years, this would amount to $99 gain from each five acres annually. Counting actual potash and phosphoric acid at five cents average per pound, the five acres would have required $74.50 outlay; leaving a gain of $24.50 on the five acres to pay for handling, applying and working in of the fertilizer. So far as profit is concerned, this carefully performed experiment of Professor Herdick seems to point to negative results; the increase in yield not justifying the increased outlay and labor.

In quality and color, the results were even more unsatisfactory, and seemed to point to the conclusion that artificial feeding could not be relied on to give heightened color, that characteristic so desirable and so valuable in our fruits.

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In the instance here cited, it is very evident that 43 years of orchard growing had not produced appreciable soil exhaustion; and that 12 added years, in which good average yields were obtained, likewise failed to produce any apparent signs of such exhaustion. It is fair to presume that the 55 year old orchard might round out its century of growth without sign of failing food supplies in the soil itself, provided proper cultivation is given. Further, there is good reason for assuming that what is true of this soil as to abundant food supply for indefinite apple growing is probably true of most of our orchard soils; and that neither do these latter need the help of, nor will they be benefitted by, application of commercial fertilizers. Here and there soils are found, where such application is essential, as in the Michigan orchards cited by Professor Burrill—light, sandy soils of low food contents. But I fully believe that in the vast majority of our orchards such application is uneconomical, to say the least.

On the other hand, I have no doubt that many soils, especially in our rich Central Western territory, have entirely too great a store of food supplies for apple growing—well adapted for tree growth, but not for fruit production. An example of this; and hundreds as apt might be cited.

Colonel D. C. Smith of Normal, well known to most of you as one whose painstaking care in any venture would not be called in question, planted, in 1884, an eight acre apple orchard of different varieties, four miles southwest of Pana, Ill. The trees were set thirty-three feet each way; and were given the best of care and cultivation under the Colonel's personal direction. In 1898, the beautiful trees touched branches, and were in the finest health and vigor. But the fourteen years had brought not even the shadow of a crop. Then he ceased cultivation entirely, and turned in sheep, hogs and calves; and in 1900 the orchard gave a large crop of good fruit. The next year found some fruit; and the year following the orchard was rented for four dollars per acre, and gave the renter $450. In 1903, owner and renter shared half and half; and about a third of a crop resulted. Since then there have been no apples of any account, and at present the eight acres is rented for $40 per year. On his home place, at Normal, Colonel Smith has repeated on a smaller scale his Pana experience; except that in the latter case no crop of any kind has rewarded his efforts and care. And hundreds of farmers on the black soils of out State are duplicating these failures, and are being lectured at in our horticultural meetings for failing to be able to do what Nature never intended should be done; namely, to raise apples on soil intended for corn and hogs.

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The opposite of this overfed condition is brought about on our orchard soils by the greed for immediate returns on the the part of the grower. Hay and grains and cover crops are grown; but to turn these under is too much like casting bread upon the waters; it takes faith to do it; and the "after many days" promise loses out when confronted with the "immediate gain" temptation. The soil, robbed of its moisture and of the season's prepared food supply, fails to meet properly the needs of the hungry rootlets; and both tree and fruits starve and fail.

Reasoning then from soil analyses, from analyses showing the rate of food exhaustion through long series of years by tree and fruit, and from actual and carefully conducted experiments reaching through a series of years, it seems fair to conclude that by far the greatest percentage of our soils do not need commercial fertilizers, in the way of potash and of acid phosphates for fruit production; and to so treat them is wasteful and extravagant. Nor do I believe that nitrogen need be purchased, but can be added in the process of proper cultivation or through barnyard manures. The foods are in the soil; are there in abundance. But they must be made available by proper cultivation and the use of cover crops. Soil Physics is as important as soil Chemistry. The food may be there in plenty; but if the physical conditions of the soil are unfavorable, these supplies lie unsued. A pantry stored with raw foods does not make a dinner for a hungry man.

How shall we treat the bearing orchard? A question every fruit-grower is asking today; and one to which many answers are given. Here again theories must give way to the results of experiment and experience; and New York and Ohio have something to tell us along this line worthy of our attention.

Two very successful orchardists of these states, Grant Hitchings and F. P. Vergon, a few years ago took a bold stand in favor of "sod mulch" in orchard treatment, thereby throwing a bomb into the camp of the "clean cultivation" advocates. Their continued success in apple growing notwithstanding their heresy, led the Ohio Experiment Station to make a careful test of the different methods of apple culture. The experiment and its results, although most of you are familiar with these, are nevertheless worthy of brief recapitulation in a paper on tree feeding.

An orchard containing two rows each of Jonathan and Grimes Golden, 20 trees to the row, was planted, and divided crosswise of the rows into four plats. To one of these, *clean cultivation* was applied; to a second, the *cover crop* method; to a third, the *sod-culture* method; and to the last, the *sod-mulch* method.

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The clean culture method on this tract proved impractical, through washing and loss of plant food; and was abandoned after three years. In the *cover crop* test, the usual clovers, peas and beans were employed, after clean cultivation early in the season; and these crops were plowed under the next spring. In the *sod-culture* plan, the trees were planted in sod, the grass was cut and allowed to lie where it fell, and a circular area a few feet in diameter about the body of the tree was kept hoed, and given clean cultivation. In the *sod-mulch* process, the trees were set in sod, but no cultivation whatever given. The young trees were mulched with straw at first; and later the grass over the plot was cut several times each year and thrown about the trees out to the limits of the branches. Mice were guarded against by fine mesh wire screens.

The results after six years, are given as follows: *Clean cultivation* a failure in this instance because of washing. Probably in any ordinary case, this method pursued without use of cover crops would result in impoverishment, through loss by washing and lack of humus for food preparation. *Sod culture,* too expensive, and decidedly unsatisfactory. The trees made poor growth, especially after the first three years, and were markedly smaller and inferior when six years of age. *Cover crops* plowed under. The trees have made fine growth annually, much better than in sod culture. The soil conditions are excellent, and the soil full of humus and fertility. *Sod mulch plot.* "Growth of trees vigorous, sturdy, uniform and uninterrupted from the time of planting to the present time." Evidently the concentration of decaying mulch upon the immediate tree in this process area has multiplied chemical and bacterial action in the soil underneath, and has digested abundance of food supplies. As a result the trees on this plot as photographed make a much better showing even than those on the cover-crop plat.

In fruit production, the sod mulch plat gave 172 Jonathan apples the sixth year, weighing fifty-five and one-half pounds, and eighty-two Grimes weighing thirty and five-tenths pounds. The *cover* crop plat gave seventy Jonathans weighing twenty-one pounds and fifty Grimes weighing twenty-three pounds, and the *sod culture* plat gave twenty-nine Jonathans weighing seven pounds and no Grimes Golden whatever. Evidently the more vigorous growth of the trees in the sod mulch plat had not retarded early bearing.

An *objection to mulching* that has been strongly pushed was taken up by these experimenters, Green and Ballou. It is urged that this method brings the roots to the surface, where they will

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suffer from extremes of heat, cold, or drought, if the mulching should be discontinued even for a time. All we have space here to say is that, by removing square foot sections of earth at uniform distances from the tree bodies in the different plats, it was found, that while the sod-mulch section had many more rootlets near the surface, it had also many more at the greater depths. And the experimenters also call attention to the fact that in cultivation, the great mass of feed roots that always find their way to the surface of the soil in search of heat and food are once a year pruned off clean by the plow share; and a new generation takes their places. In *all* forms of culture, the *main root systems* were found at a surprisingly uniform depth; the greater portion of these, large and small, lying within the first six inches. These tests would seem to leave no valid ground for the "roots-near-the-surface" objection to mulch culture.

Sod mulch or *cover crop* methods of cultivation will, I am convinced, under usual orchard conditions, give better results than any other methods. Between these two there is a question. For the first few years, the mulch method seems most favorable. But while the soil near the tree-body is steadily made richer, the rest of the land is as steadily made poorer. By and by the tree roots will occupy the entire space, and will find poor feeding. The Ohio experimenters recognize this lack, and propose to meet it by straw mulching, and allowing the grass to lie where it falls. But instead of the sod, why not cover crops that aid soil physics, and steadily add nitrogen as they grow? Or a good dressing of barnyard manure, to keep up the humus supply?

In our own sixty acre seven year old apple orchard, we sowed oats this spring, together with clover, cutting the oats while in the milk. A heavy stand of clover was obtained; and I expect to keep this orchard in clover for two years longer at least, cutting and crushing this into the surface in some manner a couple of times each season. If material for this can be obtained without too great inconvenience and expense, I expect to have a part at least of the trees mulched in additon. The trees in this orchard are in first-class shape, and in their sixth year bore a good crop of fine fruit; but the seventh, their Sabbatical year, they rested at the command of the Frost King. Another orchard, now eleven years old, after two good crops partially rested the season of 1906. This orchard we had in clover and were "hogging" it. A year ago we resumed cultivation, and last spring it was heavily set with fruit until the freezes of April and May did their work. This fall we sowed it in rye, and in the spring shall return to the clover and hogs.

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In conclusion I will mention that we are now engaged in an experiment in tree feeding in our own orchards. In our thirteen acre eleven year old orchard, in which there are six varieties running in rows lengthways, we have taken half a dozen half acre cross sections, each cross section therefore containing several varieties. Each half acre plat we are treating with a different combination of fertilizing ingredients sown broadcast. Check plats on which no fertilizer is placed are interspersed. The balance of the orchard has been given a good coating of stable manure; and this treatment will be kept up. The object of the experiment is to see what effects, if any, each combination will have, first in yield of each kind of fruit, second in grade, and third, in color: and we are especially desirous of learning whether there may not be a method of feeding our trees that will enable them to mature one crop and at the same time prepare a full supply of buds for next year's crop, thus doing away with the off year, so vexing to the fruit-grower. We expect to continue this test through a series of years; and hope to be able eventually to throw some light on the questions respecting the value of fertilizers in orchard growing on the timber soil of Illinois, and on the large body of kindred orchard soils. The German Kali Works of Chicago is kindly furnishing us with all needed materials for this test; and at some future meeting of this body we hope to have something of interest to report from this experiment.

Discussion of Prof. Graham's Paper.

Mr. Bryant—Is it not true that the University of Illinois performed experiments along this same line and as those experiments perhaps come closer home to us than these in Ohio, I think it would be very fitting just at this time to hear about them. They have been published in bulletin form, as I understand, but cannot Prof. Blair give us the results of those experiments?

Prof. Blair—If I were to stop now to run over the work the departments of agriculture in the University of Illinois have been doing for several years in the soil treatment of orchards, it would take a great deal of time and I do not think I had better try to do it now. At the same time, however, the department will be very glad to give this body the matter in detail with regard to the work that has been done here and in Southern Illinois with reference to the soil treatment of orchards. I was greatly interested in Prof. Graham's paper. I think that we all of us ought to study the things which he has for us in that paper. I think also that we should get all the information that we can from near home as well

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as from abroad. As investigators and as orchardists, we have not given quite as much attention it seems to me to this question as we should have, and it will be useless for us to attempt to give a detailed account tonight of those experiments, the conclusions would not be in form for digesting, but at some future time I would be very glad to do it, either tomorrow or next day. I might say this, in the work at Floyd, any of the plats which received phosphorus in any of its forms, or potash in any of its forms, showed marked increase in yield. The one factor, however, that seems to predominate all these fertilizer experiments was that of cultivation, the more we cultivated the orchard, other things being equal, the better the result and so while analysis may tell us what a soil may contain, it does not always tell us what that soil will produce in a crop of apples. In other words, the physical condition of the soil this year, next year and all years, is an important factor, and must go hand in hand with the amount of fertility which the soil contains. I do not believe that we can answer the question as to what fertilizer should be applied to our Southern Illinois lands until the experiments have been carried on, say, for fifteen to twenty years, when we can get the conditions which existed this year compared with last year and so strike an average. There are things in which the seasons vary very greatly, the amount of water that falls upon our soil varies very greatly at different seasons.

MR. SOVERHILL—I have been acquainted with the parties that owned the farm before the experiment station was located there. The orchard was set out at the same time I set out an orchard in York State, and they had a large meeting this year, four days at this station, and I spent some time and I took quite a good deal of pains to look over this orchard; it was certainly well cultivated. As the Professor says, it was a very unfavorable season this year and it had no rain for about two months, the apples were very small, it was the seventh of September and it looked to me as though there would be very few merchantable apples in the orchard. It was late in the season for Yellow Transparent, the ground was covered with them, but you could scarcely pick up one that was fit to eat. Just two or three plum trees that had fruit on, that is all, very few pears and the man that owned this farm before the experiment station got it was a thorough farmer, he took good care of it and everything was done systematically.

PROF. GRAHAM—I took it for granted that the experiments of the home station here had been reported to the Society from time to time, and I purposely tried to get something from outside. I knew the men were here to speak for themselves. I think that the whole work that has been done in this direction here has been exceedingly

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well done. I asked Prof. Hopkins as to the application of phosphates and he said he would advise the application of stable manure if we had plenty to apply and I am inclined to agree with him.

MR. AUGUSTINE—Did I understand you to say that a vigorous, growing, healthy tree is as liable to come into bearing as early as a tree that had been injured in some way?

PROF. GRAHAM—The theory is that it would not do it, but my theory was disproved by the fact that my own orchard has done it. Whenever I went to look for fruit in our sixty-acre apple orchard when it was six years old, whenever I saw a vigorous tree I knew I would find that full of fruit, and when I saw a spindling tree I would find few apples on it. Take the best and most vigorous trees of an orchard and I venture to say that they give nineteen-twentieths of the apples in the orchard.

MR. AUGUSTINE—It has been my experience all these years that whenever you find a tree that has been checked in growth by girdling, or rabbits, or mice, especially when girdled during the month of June, that it is checked up and will stop to make fruit buds, but when they are growing rapidly and vigorously they are not so liable to form fruit buds, and I have tested this in so many cases to satisfy myself that I was correct by just crippling in some way or other, girdling a limb or two of a tree. This last summer I had a pear tree that was growing very vigorously and right up in the center of that tree was a limb not, say, thicker than my thumb, that was loaded almost to breaking down with fruit and not another pear on the tree outside of that, and I climbed up to see what was the cause of it, and a grape vine had run up there and a little girdle had gone around it and cut in through the bark and girdled it during the previous year, and it had formed fruit buds. I cannot agree with you.

PROF. GRAHAM—I think we agree after all. I did not refer to that kind of injury. These were trees that had not made a vigorous growth, just trees that for some reason had not grown as well as the others, and the big ones that spread the branches out were the ones that had the fruit and those that were sickly, simply had not the health that the other trees had, had not any fruit, and I believe an orchard can be pushed until six years old and not injure them in fruit growing.

MR. DUNLAP—There is one thing I was glad to hear the Professor bring out, because I believe it agrees with all our experience, and that is that the use of fertilizer has very little effect upon the orchard. The fertilizer that does the most good is that of good

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cultivation and barnyard manure, and I think that where there is deficiency in the growth of the tree, if we will apply barnyard manure, we will apply the right cure to it. I have put rock phosphate on an orchard that has done no good whatever that I could see, especially on Central Illinois soil. I have not tried it in Southern Illinois, but it makes a great difference about the growth of the tree. I will say to Professor Graham, we would be allowed to infer from remarks just now that the more thrifty the tree growth was, the better the fruit crop. Within certain limits that is true. A tree that has made a good strong growth, such growth as it ought to make as a healthy tree, will be the one that will bear the most fruit, but if you over-produce wood in the tree, you go beyond the limit of reasonable growth of what a healthy tree ought to be, and you will produce barrenness. There is no question about that at all. I have bought forty acres that is planted on this rich prairie soil and I gave it pretty good cultivation for the first ten years. I thought I would make an orchard of it as soon as I could and the result was that, in my opinion, I had so much wood growth that I had very little fruit. Another orchard that was planted before, came into bearing, at a very much less age, with less cultivation. Another thing, I believe in a bearing orchard you can carry this cultivation too far. I believe you can carry it so far that you destroy the nitrogen in the soil. That is, as the Professor said, you cut out too much plant growth by very clean cultivation. Clean cultivation looks very nice, it makes a pretty orchard, and it looks nice to invite your friends down to look at it and that sort of thing, but if you have a highly cultivated orchard without any weeds at all, in the course of a very few years you will do more injury than you will do good with that excessive cultivation. I have been in the sandy soils of Benton Harbor and I was very much impressed with the clean cultivation there. It is a great deal easier to cultivate the soil of Benton Harbor which is ninety-nine per cent—I don't know but it is one hundred and five per cent sand—than it is here in Illinois, and the fact is, you have to put on fertilizer in one shape or another in order to produce good fruit. Here we do not have to do that. If we cultivate too late, we injure our trees. That is another thing we ought to bear in mind. I do not know that we injure the tree so much, but we injure the fruit crop that is on that tree, that is one thing I believe we ought to bear in mind and do our cultivating at the time of year when it ought to be cultivated and not cultivate too late.

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CORRECT PRUNING ESSENTIAL TO SUCCESSFUL ORCHARDING.

BENTON GEBHARDT, HART, MICH.

Correct pruning is necessary when the tree is first planted in the orchard, and each succeeding year thereafter. Pruning is one of the most important operations to be performed in a successful orchard. It is essential to prune the young orchard in order to obtain a perfect shaped top of the tree, and to form and encourage low headed trees. It is essential to prune the orchard regularly and quite severely each year, and by so doing, cause the tree to form a much more vigorous growth of wood and foliage. It is essential to prune bearing trees properly nearly every year, in the winter or early spring, in order to save much thinning on many varieties of fruit, thereby giving larger and finer quality of fruit.

It is essential to prune properly to lessen the expense and time in harvesting the fruit when the trees in an orchard become large and in full bearing. Proper pruning of the orchard tree, such as the apple, pear, peach and plum, thus becomes necessary, to give best results in bearing first class fruit and convenience in harvesting the crop. Prune the young tree to have somewhat of an open center. Start from three to five limbs as leaders. Keep these in an open and symmetrical form, free from limbs crossing or lapping onto each other. By pruning each year in the bearing peach and apple orchard, the limbs in the top do not become so dense and crowded close together.

Prune the apple tree with much care and thought to keep the tops opened up, and let all the sunlight into the tree and fruit as much as possible. Prune in such a manner as to leave the top free from large limbs crossing each other, and becoming too thick, to cause density of foliage. But do not prune to form long bare limbs in the trees, cutting away the finer limbs and fruit spurs of an apple. The annual, sometimes severe, pruning of the apple, has a tendency to produce a much stronger growth of young wood on a bearing tree, giving larger and finer foliage on the trees. By pruning the apple heavy, it produces stronger fruit buds—with less profusion of bloom. An over abundance of blossoms, many times seems to so exhaust the tree and vitality of the young fruit, that very little of the fruit sets properly to produce a crop.

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I at one time came into possession of an old apple orchard, consisting of Baldwin, Northern Spy and Greening varieties, which had practically received no pruning for over twenty-five years. This orchard would bloom very full—trees being one mass of white blossoms every year, but seldom bearing a good or heavy crop of apples. The orchard was sprayed properly, but with no beneficial results, as far as its bearing conditions were concerned. As a last resort, the trees received a heavy and most severe pruning of the tops early in the spring. As high as a good wagon load of brush was taken from some of the trees. As a result the trees began to bear fine and good paying crops of apples, and have borne nearly every season since receiving this heavy pruning.

So I say, prune your large bearing apple orchards more thoroughly and in return receive more bountiful crops of fruit. An orchard thus pruned has a tendency to bear more, annually—and give paying crops of fruit. By proper pruning the largest and most highly colored fruit can be produced. Proper pruning of the apple and other large tree fruits, very much lessens the cost of expense in picking and harvesting a crop, as the fruit on a low and comparatively open top tree, can be gathered at much less expense, than on a tree having a very high top, or one filled with superfluous brush. Furthermore an apple orchard which receives the right pruning each year can be sprayed at a much less cost per acre.

Fruit trees, such as the apple, peach and plum, which seldom receive any pruning, set too much fruit, and by so doing, exhaust the tree and produce fruit which is small and of poor quality.

Many varieties of the apple and other fruits which are left to over-bear can not be expected to bear annual crops of fruit. Therefore it is not only highly essential to prune the apple, and other large orchard fruits each season for the appearance and beauty of your orchard, but it becomes very necessary to prune the orchard properly in order to receive annual crops of choice fruit, as a matter of dollars and cents to the orchardist.

The peach also is very much benefited by an annual pruning. Take out all dead wood in the trees, and cut back the strong new growth, over one foot in length to within six to eight inches of last season's growth. The peach thus pruned will produce a low, symmetrical top, and the fruit can be picked at a much less cost per bushel than is ordinarily done in the high headed peach tree. It also gives fruit a much larger size, higher and more beautiful in color and superior quality. From an experience of over twenty

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years in growing the peach for market in Michigan, I can recommend this practice of pruning highly and as the only method whereby large, fine and profitable crops of peaches can be produced.

The pear and plum practically require the same treatment, but not quite as severe and heavy as does the apple and peach. Thinning out the wood in the tops well, cutting back or so-called "heading in" of the last year's growth where a very strong growth is produced.

All summed up, pruning is highly essential to produce fine and profitable crops of fruit.

Discussion of Mr. Gebhardt's Paper.

Mr. Dunlap—I would like to ask Mr. Gebhardt, does he recommend the cutting of these large limbs or smaller ones very close to the tree, or at the place where the ordinary roll in the bark is?

Mr. Gebhardt—Yes, beyond the roll. Outside of it. You know where that sort of swelling is at the base of the limb, just beyond that. It seems to callous and heal better if cut very close.

A Member—What do you put on the spot when you cut it off?

Mr. Gebhardt—We do not use any paint or anything.

Mr. Periam—You do not produce any big places that need painting?

Mr. Gebhardt—No, not when we begin when the tree is young. That is the practical point, it will save a great deal of labor and expense in after years. If you start your tree young and look after it each year, or every other year, there is no use or necessity for cutting away any large limbs, if the orchard is pruned properly in the beginning.

Mr. Periam—You in the fruit belt require more pruning than we do here. Your summer temperature is not so high.

Mr. Gebhardt—It may be. It may also be that we have a little more sandy soil. In the State of Illinois it may not require so much pruning, but it might be necessary to let in the sunlight to produce fruit of a good quality. I would rather take the trees that had less cultivation, mulching or something of that kind, than not prune and get the growth.

Mr. Dunlap—How high do you head your young apple trees?

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MR. GEBHARDT—About two and a half to three feet. Two and a half is the rule, starting the limb.

MR. AUGUSTINE—The trouble is, with severe pruning wtih us in this section, it provokes too much growth.

MR. DUNLAP—I have to differ with Mr. Gebhardt in one thing and that is this, that there are times in the life of an apple tree when you have to do some severe pruning. The time at which you will start an apple tree is one thing and the height at which you will cease pruning is another, and it depends on the age and growth of the tree. If you start a tree at two to two and a half feet, which I do, if I have a perfect tree at that age, and from that up to ten years of age, why, after ten or twelve years of age and as the tree gets older, you are obliged to do some pruning of large limbs, you have to cut out some large limbs in order to keep your branches up. Now, then, these branches are three and four and five feet long; they will stand up from the ground, their growth has been a little upright, just a little off the ground, and they do not grow straight out, but the limbs rise. The bearing of the fruit then is near enough the tree so that it does not lie on the ground. But you let those limbs grow until your tree is fifteen years old and remain unpruned and those lower limbs will lie on the ground and they are useless to the tree for fruit bearing purposes, but they are essential to the tree if you want a crop of fruit in the early years of the orchard. I have seen many an orchard in the southern part of this State that was trimmed up three and four feet high, headed up that high, trees that were eight to ten years of age. They had a little umbrella top that if you had a crop of fruit there were not enough limbs to hold more than a bushel or two of apples, or a barrel at most, but if those trees had been headed two and a half feet from the ground, they would have had double the quantity of fruit on the trees. I am not guessing at that, I know these were the actual results that have been obtained. When the tree that has been headed low comes to be fifteen years of age, those limbs become long, those lower ones, and you have to cut them off, and I am trimming in my orchard now, limbs that are two and three inches through, and I do not think it is any detriment to the tree to cut those off. I think it is an advantage to do it, but I would not have them cut off when the tree was young. I want the top to bear the fruit when the tree is from eight to twelve or fifteen years of age and after that it has plenty of top and then you can dispense with these lower limbs. You have got to keep trimming right along. My thought is this, that you cannot start a tree when you set it just exactly as you will eventually have it, because I have trees in my orchard where the limbs are within eighteen

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inches of the ground and yet you can go underneath the tree and walk around the tree and never touch a limb on it, because those limbs have been brought down that way by the fruit, and you have got to trim along the trunk of the tree in order to get your limbs off the ground, that is, you have got to keep trimming—that is the real idea.

MR. GEBHARDT—I do not wish to be understood that I do not recommend pruning as the trees grow older. I agree with the Senator that you have to trim some in after years. I do not know how it is in Illinois, but in Michigan some varieties are very upright growers and you can form a top and grow nice shaped trees and upright, such as the Northern Spy, and Baldwin, while Greening, Ben Davis and some other varieties grow straight out on the ground and you have to trim the lower limbs off and keep them trimmed off in order to protect them, but I have seen just as fine fruit, in fact finer fruit, from the center or upper limbs as I ever have near the ground. We do not have to trim to protect the bodies or the limbs, but we want to keep them as low as possible in order to harvest the fruit and do the top spraying perfectly and it is a labor saving business to prune and keep the tops just as low as possible and still not interfere with cultivation.

MR. NELEY—I would like to ask if there is any particular season of the year that you prune. I think you said in your paper that you prune in the early spring and I would like to know if you think it is better to prune in the early spring.

MR. GEBHARDT—I prefer that time, although when we have open winters, I would rather prune in the winter than not at all.

MR. NELEY—Why do you prefer the spring?

MR. GEBHARDT—For the reason that it is a little better to do the work in warm weather than it is in the winter up in Michigan. Another reason, I have noticed that the later we do it in the spring, the quicker the wound heals over and makes a finer growth than it does in the winter.

MR. GARDINER—I have forty acres that I am contemplating giving a severe pruning. It is one of those orchards that has not been bearing very successfully and I would like to hear from the convention a little further on that subject if any one has any idea as to when it is the best season of the year to prune. Some people say spring is the best season, because they will not water-sprout. I would like to know whether any member has had any experience in that line and can give me any guidance.

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A. J. DUNLAP—I will just give my experience in pruning last year, for instance, on the Grimes Golden orchard that I have set five years. I pruned some of it last February and March; there was a part of it, however, I did not go over. I will say in this pruning there were quite a number of limbs I had to thin out. After I got my corn and peas planted in the spring, I had a slack time in June, and I finished those Grimes Golden with the same system of trimming and to-day the wounds from the June pruning of those Grimes Golden are all healed over, while from the February and March pruning about one-half of the wounds are still there. That has been my experience with those trees. They have been set five years and I cut out from one to two of the largest limbs, that is, to thin out the top. I had left too many limbs. The system of pruning was identically the same, I did the work myself.

MR. AUGUSTINE—I want to say for the benefit of the gentleman that I am satisfied that the pruning in June will heal in half the time that the winter pruning will. There is no question about that. But yet, in some varieties you may sometimes prune a little too early while the sap is very thin, and they may bleed, just as the grape does sometimes. That occurs with some varieties, but I think there is no better time than June for pruning.

PROF. GRAHAM—What is the difference if they do not heal fast?

MR. AUGUSTINE—If a good sized limb is pruned in winter, it will never heal over. In a young tree, it may do it, but it is quite a while doing it. But I would rather have it heal over than to have that die and rot in the center.

A. J. DUNLAP—I would like to say one more word in regard to the question of sprouting, that after this February and March pruning there were quite a few water sprouts, while from my June pruning there is scarcely anything in that line. I wish I could do all my pruning in June.

MR. GARDINER—Would you prune in June when your trees are set with apples?

A. J. DUNLAP—Yes, if they needed pruning I would.

DR. BURRILL—I had the very great pleasure of a visit to Mr. Gebhardt's place this last August. I did not, unfortunately, meet him. We say a tree is known by its fruits. I think you can pretty well tell what a man is by his fruit plantation. I do not know anything about what results followed the year's work on that farm, but if they were not satisfactory, I never saw anything

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that gave so good a promise of a thing and then turned out wrong. The whole place had the appearance of being in order. Every tree seemed to have been visited and put in order. The conditions surely were favorable, the foliage all around of the finest kind and fruit hanging there which was a first rate sight for one who could anticipate a little. It made one feel a little anxious, knowing that he had to go away before the end of August, but there is something there and if it is pruning, then I feel satisfied that the pruning adopted was the thing for that locality and situation. I don't know whether it would be the thing for Champaign county or not, or for Illinois generally. I think it is altogether probable that we shall have to adapt even pruning methods to the quality of the soil and other conditions under which the tree is grown, but if we can work to put things into the satisfactory condition that I saw over there at Mr. Gebhardt's place, I think we would be pretty well satisfied.

MR. GEBHARDT—There are just two points which I wish to mention which were brought up here in regard to late pruning. As one gentleman said, in late pruning in June you are not contemplating being bothered with water-spouts as you are in the winter and spring, and it saves a great deal of thinning out in the next season, and I also wish to say that there is a certain time of year, about a week I think before they blossom that it is not quite advisable to prune the apple. It is when the bark springs very easily and the limbs seem to bleed, they consequently do not heal nearly as fast and as readily as they do if pruned later.

MR. SOVERHILL—I agree with him exactly where to cut the limb off, just at that little bulge, but if I had my way, I am like the man with the grape vines, he thinks about the warm weather. It is pleasant in the fall, the ground is dry and nice and for the last twenty years I have done all my pruning in November and December, when it is warm and pleasant. Of course I cut off no large limbs, but I think you do not get any bad results by trimming in November and December. At that time the sap is very dry and they heal very quickly with me.

PROF. GRAHAM—I agree with that. We have done our trimming largely in November and December and we have had no bad results. I think you will not find very much time to trim in June, it is hard to find trimmers, and we find with seventy-five to eighty acres to trim, we cannot do it, and if you take advantage of every good day at times when it is not too cold to trim, you can get it done, and I never found any trouble with water-sprouts with our trees at one time more than another.

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MR. AUGUSTINE—Why do you paint the wounds in your trees?

PROF. GRAHAM—I do not know that it is needed, perhaps it is not. I would like to know that, but it stands to reason that the stub will be more inclined to absorb water if it is not painted than if it is painted and we have found this, that our trees heal very perfectly and very quickly and we always paint them.

MR. AUGUSTINE—Where is the advantage of the painting?

PROF. GRAHAM—The advantage of the painting is this, that if there is any chance for the water to work into the tree, it will start a rotten stub that will not heal up. There is a chance there for absorption of water if it is not painted over.

MR. AUGUSTINE—That is why we want to do the June pruning, so that it will heal over.

MR. LAMBERT—If pruning in the winter season is followed by extreme winds and when any considerable sized branch is cut off from the tree, the extreme winds will dry out all the sap in the exposed portions and you will notice very often there is a large crack in the sound wood, say thirty days after cutting off the limb, for that reason I believe that white paint is an advantage. It is in pruning in late winter. I believe it prevents the drying out of the sap in the wood and the bark around it. I think that is probably the most important thing. In regard to June pruning, it is an ideal time to prune trees for quick healing, but there is this disadvantage, if you are establishing a young orchard with a large amount of foliage on the trees, it is almost impossible to tell which is the right limb to take out. However, I practice mostly the late winter pruning and protect with paint on the wounds, for the reason I believe it prevents the wood drying out and cracking after the wound is made.

A. J. DUNLAP—There was one thing in regard to water-sprouts. Something has been said about June pruning being favorable to the non-growth of water-sprouts and I think that is correct, but then there is the other thing of getting your work done in June; that is almost an impossibility, and for myself I would rather prune in November and December and know that the pruning is done and sleep well the rest of the winter, knowing that it was done; then if I had time in June, the first part of June or last part of May, when these water-sprouts are two or three or four inches long, I would put strong gloves on a man's hands and have him rub those water-sprouts off. He can run his hands over the limbs and rub them off and he can do five or six times the work that

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would have to be done next winter cutting off the water-sprouts. You can save a lot of labor by rubbing those sprouts off. I know by actual test, having rubbed some of the rows, that you can do it in one-fourth or one-fifth of the time that it would take if you wait until the next winter and use a shear to each separate sprout.

MR. AUGUSTINE—There is one thought that has not been brought out. It is an old axiom, prune an old orchard, if you prune for fruit, in the early summer; if you want wood growth, prune in the winter, and I have known of a great many instances where orchards have been shy in bearing that have been benefited very much by summer pruning instead of winter pruning.

MR. PERRIAM—My experience in relation to water-sprouts is that as a rule they are the result of excessive pruning. Water-sprouts grow from the dormant bud and it may be from an abnormal excess of moisture during the season. I have set out three orchards in Northern Illinois and have always been pretty successful in raising fruit, although we do not have the trees on this side, large and comparatively well kept at fifty years of age, as I have seen them in the fruit belt in Michigan.

MR. GEBHARDT—I would like to hear from some peach growers in Illinois, whether they raise large crops of peaches in Illinois without pruning. In Michigan I think the majority raise a crop without pruning.

MR. NELEY—I live where we grow a great many peaches and we do not think of growing peaches without pruning, in fact, the tree would soon get where we could not gather the fruit. If the land is not strong enough to produce that kind of tree, it does not produce fruit on it, and I cut the peaches heavily, cut the limbs right off, ten or twelve feet, I do not let them grow higher than twelve feet. Cut them off any time after the fruit is gathered, or I cut them off in the spring.

MR. SIMPSON—There has not been anything said about heading-in. I would like to know whether any one has had any experience in that line with an orchard fifteen years old. I know what is being done in the west, on the coast. I wonder if any one has had experience here in dehorning, I mean in the apple?

THE PRESIDENT—The same as they do with the peaches?

MR. SIMPSON—Not so severe, but on the same principle.

MR. GOODRICH—I do not believe peaches are grown anywhere without trimming the trees, at least I do not know of any such

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place. I trim mine, cut them back; you have to cut the peach trees back and keep them cut; if you do not, the wood gets so brittle that it will not hold up the crop. Peach wood is not like apple wood. It is more tender, more brittle, and not so strong. You can sometimes dehorn, you can go out and do as the gentleman states, cut them off at the top, have the man on the ladder do it. May we hear from the question box? I have one question handed in and that is, "Can ginseng be successfully and profitably grown in Illinois? State the best method." Is there any one present here who can answer the question?

PROF. GRAHAM—One of our men makes considerable money growing that and he, with the assistance of another, has planted out a plat of one-half acre, and it is coming along. That is all I can say about it.

MR. GARDINER—I was talking with a firm that handles gingseng and they told me that hereafter ginseng would not bring the price in the market that it did at one time. I contemplated setting out some plants, but that information given me by a wholesale dealer kept me from doing so.

A MEMBER—I am a grower of ginseng on a small scale, and I would say that the present price bids fair to be surpassed in a short time, because the Chinese are learning of the garden ginseng. It was strange to them at first and they would not pay the price they did for the wild ginseng; they wanted large white roots, but they are taking hold of it very readily and they are getting interested. The native wild roots are practically lost and extinct at present, but the garden ginseng can be grown successfully, and I believe is going to be a money making proposition. There has been a great deal of newspaper advertising about it and get-rich-quick schemes and circulars sent over the United States; everybody got the fever, but it is now getting down to a legitimate basis on which all these get-rich-quick promoters are out of it. For anybody that really takes hold of it as a straight, legitimate proposition, I believe it is a money-maker.

MR. GOODRICH—In Southern Illinois and Kentucky and Tennessee there are vast quantities of ginseng growing wild. At about war time and since it has been nearly exterminated. The price was so high that many farmers engaged in the regular business of going out, after the crops were laid by, and picking ginseng and shipping it to St. Louis. It was worth several dollars a pound and all of our dealers in town handled it and shipped it just as they would ship any other fruit that was brought in. The price ran

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about $4.00 a pound and there was an advance; I think it got as high as $8.00 a pound, and some farmers would make as much in dealing in ginseng as they would make in the other summer months working on their farms. But of late years the industry of supplying the demand for seed and roots became so great that misleading advertisements were put in the papers and seeds were sold at $5.00 a pound or a quart, and the roots in proportion. The cultivation of the plant is very interesting. I have a small plantation of it myself, it affords quite a study in a botanical way, but it is very hard to get started. You buy the seed by the quart, but it takes eighteen months for a seed to grow, it has to be in the ground for two seasons and it must be grown in the shade, in the shade of the woods or artificial shade must be provided for it, but I do not think it has ever been profitable; anything that has been grown in Union county I do not believe has ever paid the expense of growing it.

MR. NELEY—I know of one man in Union county that grows ginseng, has quite a considerable garden, and he claims it is profitable. He keeps his shaded, has a building that is high enough to get a horse and team under and he has shaded it with laths, covers the frame with laths, leaving about as wide a space as a lath. It was splendidly cultivated, I looked at it, I am acquainted with the man.

MR. GOODRICH—Has he ever shipped anything for commercial purposes?

MR. NELEY—I do not know whether he sold anything for any other purpose than propagating.

MR. GOODRICH—The propagating price is very profitable.

MR. NELEY—He made a profit out of that, but whether he is going to sell it in a commercial way I do not know. I know he had been selling at a fabulous price to propagate from.

MR. GOODRICH—Growing for seed and selling it to the other man is profitable, but whether the other man is going to make anything out of it is a question.

MR. PERIAM—It is well known that this plant cannot be grown in a hot summer, and so far the facts are that the men that have had the ginseng plants and the seed to sell are the ones who have made the money. There has been no special export of ginseng made from the United States, of plants raised by farmers or growers. You cannot grow it without growing it under cover. You have got to cover it either with cloth or else under the shade of trees

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and you cannot raise much of anything in that kind of way. The whole thing in relation to ginseng, as I understand it, and I have studied it pretty closely, is a fraud.

MR. SOVERHILL—There are two parties in Tiskilwa who have been growing it for five years and they are very much encouraged. They have grown it from seed and produced the plants and have sold eighty-five pounds and they told me that the idea of the cultivated plant selling for less was a mistake, that they had charged the full amount and it was worth more than the wild root.

MR. DUNLAP—Have they sold it in a commercial way or have they been selling plants?

MR. SOVERHILL—They have been selling the plants. They just got the seed a while ago and started it and have been at it for five years and they have covered over a very large plat of ground with a sort of mosquito netting. That was last year, this year they covered it with laths and they are planting on a large scale. It takes a year and a half for the plants to start.

MR. JINNETTE—I have a neighbor who took twenty-five pounds this fall to Cairo. He told me he got $125. This was grown under cover. He had a bed covered with lath or two-inch strips, but I don't know what that cost him. He told me he had spent over $250 already for the roots and seeds to plant the bed, and I think it cost him about $250 for his shed under which he grew it, so you can see how much profit there is in it.

MR. GOODRICH—I would like to ask Mr. Periam if the selling of ginseng is advertised in the Prairie Farmer?

MR. PERIAM—After I got too old to edit the Prairie Farmer. This thing of making money in ginseng is a fraud for the reason that I stated, that it cannot be grown in places that have strong sunshine.

MR. AUGUSTINE—I want to caution the friends here not to go into the business, because I understand they ship it into St. Louis to put it into beer and the temperance wave is coming so fast and so strong that there will be no use for it in a very short while.

MR. PALMER—In our country we are raising considerable for sale to the other fellow, sold over $600 last spring. One man raised it under a lattice work, and he now has nearly two acres, and he actually sold over $600 worth last spring.

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MR. NELEY—The fact of its having to be raised under cover does not necessarily make it unprofitable. The most profitable tobacco raising is done under canvas cover in Florida.

MR. PERIAM—Yes, and some oranges are grown that way, but I am speaking of the price of the stuff after you get it.

THE PRESIDENT—At Harvard, Ill., Mr. Hecke has a plant there, has it in growing, and I know that it is a money-making thing for him. I have visited the establishment. Any one who will write him will find out further particulars about it. He has been in it for ten to fifteen years, takes a great deal of pride in it and follows it right along. He said at the time of the Chinese war the thing went slow for a little bit, but since then it has picked up and is bringing good prices, a good demand for it at the present time.

MR. PERIAM—How much does it produce a year?

THE PRESIDENT—I cannot give you the particulars. I saw the establishment.

THURSDAY—MORNING SESSION.

The session was opened with prayer by Rev. J. C. Baker.

GROWING WISCONSIN APPLES.

L. H. PALMER, BARABOO, WIS.

When our fathers began to raise apples in Wisconsin they found climate conditions so unfavorable for the old eastern varieties that most of them became discouraged and gave their attention to products that would bring them quicker returns. A few, however, preserved and succeeded in bringing out new varieties that have proven very satisfactory in every respect.

The localities in Wisconsin that are rather rough and hilly with light, well drained clay soil, and plenty of timber for protection, have proven to be ideal places for apple culture. In these localities, properly selected varieties well cared for, make orcharding both pleasant and profitable.

In selecting varieties choose only such as have proven to be not only hardy, but those producing an abundant crop of good sized fine-flavored fruit. I would recommend Lowland Raspber-

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ry and Duchess for early; Wealthy and McMahan for summer; Utter, Plum Cider and Patten's Greening for fall; Snow for early winter; Newel Winter, Northwestern Greening, Golden Russett for late winter, and for a sweet apple the Tollman.

Before setting the trees be sure the soil is in perfect condition. They should be set not less than twenty-four feet apart each way, thus giving space for cultivation and a free circulation of air. Protect the growing trees from the bad effects of sun and wind by leaning slightly to the southwest. Prune to form a well balanced top from three to four feet from the ground, and as the tree grows watch carefully and cut away all unnecessary sprouts.

It is well to raise some cultivated crop among the trees the first eight or ten years, being very careful to keep the ground level. Should the soil begin to wash, seed to clover for a year or two, but remember as soon as the cultivation of the trees stop, the growth will be slow and a stunted tree like a stunted animal is a pretty poor investment.

The rabbits and mice should be looked after. A piece of wire screen fastened around the tree is sufficient protection from the rabbits and if all litter is kept from around trees there will be little trouble from the mice.

When the trees get well to bearing they exhaust the soil rapidly and the fertility must be kept up by a liberal use of barnyard fertilizer, and an occasional top dressing of wood ashes improves the color, and I am convinced prevents immature dropping of the fruit to some extent.

If the ground can be plowed late in the fall and crossed with the disc or spring-tooth, and all litter cleaned from around the trees it will help to rid the orchard from the gouger and codling moth, although it at times may be a little hard on the roots of the trees. I have had no bad results.

In the spring begin with disc or spring-tooth as soon as the ground is fit to work, working the orchard each way at intervals until about July first, when the ground should be seeded to some cover crop; perhaps oats are as good as any thing. When it is time to pick the early apples, the green growth should be mowed and placed around the trees for a mulch. Before plowing in the fall the mulch should be taken away and destroyed.

Experience has taught me that there is little use in trying to raise good marketable apples in Wisconsin without thorough

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spraying the trees at least three times with Bordeaux, adding Paris green or some preparation of arsenic to the mixture at the second and third spraying.

There is little danger of the apple business being over done in the more favored localities of Wisconsin as the soil and climate will produce a superior quality of fruit, which will command a ready market in the great northwest, where there will always be an ever increasing demand for fruit.

DISCUSSION OF MR. PALMER'S PAPER.

MR. BRYANT—I would like to ask Mr. Palmer if I understood him that he would sow a cover crop and turn that under in the fall and not leave it on the surface for the winter?

MR. PALMER—I do, yes, I mow the cover crop about the time the apples are ready to pick, that is, the early apples. This year it was left in the orchard until I got ready to plow it in the fall, but I generally pack it around the trees for a mulch.

MR. BRYANT—Why do you turn it under instead of leaving it on until spring?

MR. PALMER—I find that late fall plowing is about the only remedy we have for curculio and gouger. It seems to be very effectual with us.

MR. HARTWELL—What is the Wisconsin estimate of the Northwestern Greening?

MR. PALMER—The Northwestern Greening is a great bearer, a very nice looking apple. Of course it is not quite up in flavor with some of the earlier apples, but with me it is a splendid bearer, and a very nice apple.

MR. HARTWELL—Do you find it keeps?

MR. PALMER—Properly taken care of it keeps pretty middling well. It does not keep with the Eastern Greening, it can be kept until spring, it will keep until March, along there pretty well.

MR. HARTWELL—With us it is a serious fault of the apple that any little defect is almost destruction to the fruit. If there is the least particle of breakage of the skin, or attack by curculio, it will rot at once.

MR. PALMER—It does not bother us that way.

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MR. HARTWELL—A perfect apple will keep, but imperfect ones will not keep at all. It makes it a very serious problem whether it is worth the planting.

MR. PALMER—The only question with us is hardiness and it seems at least to be hardy. Some think it is not hardy enough for our country. One thing with me, it bears very early, and an apple of that kind, if it is not quite as hardy, will pay for itself before it does die.

MR. BRYANT—There is one thing about this curculio—as I understand Mr. Palmer, he advises the fall plowing because he thinks it gets rid of that. Now, our authorities in this State have always told us to cultivate during the summer months, surface cultivation, and they have never advocated the fall plowing. It is something new to me. My impression is, from my own experience, that summer cultivation is a good thing, it does help.

MR. HARTWELL—I am inclined to believe that the Wisconsin people are more justified in fall plowing on account of their more regular winter coat of snow than we are.

MR. PALMER—We have about one winter in three that we do not get any snow until quite late, but I have never had any bad results from plowing, although I feel a little nervous over it sometimes, but I find when I plow late in the fall, as late as I can, that I have very few gougers. If we do not do something of that kind, the gougers will get our fruit every other year at least. As I understand the nature of the gouger after it gets through with the apple, it gets under the leaves of the tree, under the grass and burrows, and plowing throws it out.

MR. HARTWELL—You throw it out of bed and it gets its toes frozen?

MR. PALMER—That is my idea.

MR. GRAVES—I would like to ask Mr. Palmer if you do not grow more light colored apples than you do of the red and if so, why do you do it?

MR. PALMER—Well, our Snows are good apples. We do not grow more, but we have a good many light colored apples. We have to take varieties that do well with us. The Northwestern Greening of course is a light colored apple.

MR. SOVERHILL—Will the McIntosh do well with you?

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MR. PALMER—It does, yes. They have been a little suspicious of them because they have been scabby. The Snow scabs pretty badly if you do not care for it.

MR. SOVERHILL—What do you think of the Wealthy?

MR. PALMER—The Wealthy is our main crop. It grows to a good size and is a splendid colored apple, in fact, the Northwestern buyers from Minneapolis and Duluth have been coming to our country looking for the Wealthy.

THE PRESIDENT—Will Mr. Palmer name the leading apples, that you grow up there, the leaders that are hardy?

MR. PALMER—Well, we raise the Duchess of course, for early, and then we have the Lowland Raspberry that is just coming into use, that has proven very satisfactory with us. It is a nice colored apple. It is not a red apple, but striped, very pretty. It is earlier than the Duchess even. And then we have the Wealthy, of course that is our main crop, and McMahon, that is a large white apple, I do not know whether you raise that here or not. They are a great seller if we can harvest them without bruising them.

MR HARTWELL—Do you do anything with the Wolf River?

MR. PALMER—Yes, we are raising quite a lot of Wolf River, a great show apple. That is the main thing. There is this thing, that they will hang on the tree and rot if there is any little imperfection.

THE PRESIDENT—I notice Dean Davenport is with us this morning and we shall be very glad to hear a word from him.

DEAN DAVENPORT—Of course it is not necessary to say how much we appreciate these meetings here. I do not suppose the animal husbandry students care much about it, but the horticultural students certainly do. It is an inspiration to any interest to watch the people who are making their money in that line who come to the University to hold their meetings. Of course our students are in their classes all along and they will be dropping in during the day and whatever the students get as they do drop in between classes is directly helpful. The whole thing is good and we do not want to be piggish about the matter, but to tell the honest truth about it, we wish and hope that this kind of meeting may be an annual feast here. The latch-string is always out. Do not wait for an invitation, in fact, there is nobody competent to invite you, it is your outfit from start to finish, except as you share it with other interests somewhat similar. It is the creature of the people,

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to do the business of the people along those particular lines. The attendance of students has increased twenty-five per cent. since last year. There has got to be an end to the thing somewhere. I do not know but it might be worth while the few moments I stand on my feet to read a little manuscript that I keep in my pocket, it is so short and so full of meat. It gives the history of the attendance of students in agriculture in this college running back to 1891. In 1891 there were seven students here; next year there were only six, one evidently got tried, discouraged or mad, I don't know what happened to him, we never saw him. That was before I came, before any of us were here that are here now, except Dr. Burrill and Dr. McIntosh. The next year there were thirteen, a great boom. The next there were only five, the boom did not work. That was the year that I first made the acquaintance of the University, with four students registered during the year, 1904 I came, the first day of the next year there were nine students, I don't know whether that started that increase of four. But there was a talk of a college of agriculture in those days, it had been talked before. There was talk afterwards, but talk did not seem to make a college; they did not seem to be able to build one on talk. The next year there were fourteen, the next seventeen. All during this time there was talk, more talk, plenty of talk, talk about a horticultural building, the first talk did not even get decent consideration down in Springfield, but there was more talk in 1898. There were nineteen students in 1898, and then in 1899 there was an appropriation. There were nineteen students, going on up hill a little bit, and that was the winter this building was provided for the students; attendance increased to ninety in 1900. That was the year we moved into this building, the next year there were 159, then 232, then 284, then 339, then 406, and 430. In 1906, six years after the building was built, the students' attendance had increased from twenty-five to 430. In the meantime, two departments had moved out, the household department had gone to the Woman's Building, the farm machinery department had gone to their building; in 1906 we were obliged to expend ten per cent. of its original cost in overhauling and increasing the capacity of this building, have doubled the capacity of the building. We have either got to club students away from the college, or else we have got to have more room. Last year there were 460 and this year the estimated registration is over 500. That includes about sixty girls who are studying in the household science department who are registered in this college. Now, it seems to me this is a satisfactory showing. In every case where there has been an increased appropriation, either for investigation or teaching, in every case

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where additional instructors have been put in there has always been an increased attendance. There are 120 that are specializing in horticulture.

As to instructors, in the very beginning there were only five or six people connected with the college and stations both, in any capacity at all, some of them giving a large share of their time to other interests; now there are sixty-two, I think, in the College of Agriculture and experiment stations, nearly all of them giving their whole time to agriculture. Dr. Burrill divides his time between this work and the other university work, everybody else I think devotes his entire time to agriculture, either experiment station or college. Now, that increase, from almost no money up to our present funds, and four or five people as instructors and investigators up to sixty, goes right along with this increase of number of students, so we are trying to make it a center of agricultural investigation and instruction. I might say, while we are among ourselves, that this is the largest number of instructors engaged in any institution of the kind in the world, and we give more instruction in agriculture here than is given in any other institution. These students do not come for a day, they are here throughout the year, and while we take many without high-school diplomas, you will be glad to know that we graduate just about the same proportion of our students as are graduated from the other colleges in the university, so that our method of admission is satisfactory. Our students are here for real work.

I might say two things—one is that we have only commenced our work along these lines in the university, and the other is that before many moons shall pass away I am thoroughly satisfied that we shall find the high schools in this State doing work in agriculture. That has never yet been dreamed of in the country. Now, this matter just at present, I think, is the great issue before the agricultural people. We are going to have more instruction in agriculture in some shape, more than we ever had before, and more than we can give here, and more than ever will be given at any one point in the State. I said we will have to club students away from here, or increase the capacity in some way. Now, we are not going to club students away from here, and yet you know we never could accommodate at the university all the students that ought to be studying agriculture. We are going to do one of two things in the very near future; we are either going to expand the capacity of our high schools and teach agriculture in those schools and under their management as they do other things, or else we are going to have a new kind of schools spring up in the country, separate schools for agriculture. I do not know what you think about it, but as for

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me, I believe in the high school. I dislike to see the high schools notified that they must let agriculture alone and that they will have another kind of school to teach agriculture right along outside. I want to say this, that it is not very much of a vision for us to see in the future the high schools over the State doing a perfectly tremedous work, not only in other things, but in agriculture and in mechanical training, domestic science, all the things that the people need to know. Is it too much to expect that the high school shall take care of the educational needs of all the people in its region? That if the high school cannot do it in one building, it will do it in two, and if it cannot do it in two, it will do it in six. Now, it is folly to say that the high school cannot do any more than it is doing—that the course is full. It is simply a question of expense and a question of men and training; and as to expense, it is a great deal cheaper to do this thing under one administration than it is under two or three. Shall we as farmers not insist that every school that undertakes to teach young people shall teach the farmers as earnestly, as industriously and as successfully as they teach the other people?

MR. GRAVES—What is your appropriation here for agriculture?

DEAN DAVENPORT—We get each year about $90,000 for instruction in agriculture and about $122,000, a little over, for investigation.

MR. GRAVES—What is the appropriation for the entire university?

DEAN DAVENPORT—Roughly speaking, it is about one and one half millions for two years; that includes the figures I have given you.

MR. GRAVES—What would be the sum total, the federal and the State?

DEAN DAVENPORT—The federal appropriation of course is the same for all the states, except what comes out of the land grant. The federal appropriation in land, flat amount, to the university is $25,000, under the second Morrill act it is $15,000, under the Hatch act it is $,9000, under the Adams act $9,000, then our claim from the original land grant is about $28,000 a year for the university as a whole; we get one-half that; we get one-half the fund, the rest of it comes from the State.

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SOME PROBLEMS OF CO-OPERATIVE MARKETING

J. B. GRAVES, NEOSHO, MO.

MR. GRAVES—Mr. President, I am from Missouri. However, I am a native of Illinois. I am very proud to say that from my infancy to the prime of my manhood I spent my life in the grand State of Illinois. In my boyhood I played on her hills, roamed on her prairies, swam in her pools and fished in her streams. What scant education I have was acquired in her schools. My first best lessons in agriculture and horticulture were learned in her fields. Here in my youth the girls courted me and one of them married me, and here four out of every five of my children were born. Here did my father and mother spend their declining years; at last succumbed to the King of Terrors and now lie side by side, silent and cold, beneath Illinois soil. No wonder that I am greatly attached to Illinois and am glad of this opportunity of being once more in the home land. I learned to love Illinois in my childhood, and at that time I thought that Illinois was It. And I frequently thought and said that whoever leaves Illinois to seek a better country, to find it he must go up. When I was a child I understood as a child, thought as a child, I spoke as a child, but when I became a man I put away childish notions and moved over into Missouri. I have read that in the Far East they have a fruit that surpasses in excellence the best American orange, but its odor is so offensive that when a man first begins to learn to eat it he is obliged to hold his nose, yet when once he gets a taste of it, that taste is so delicious that it transforms the offensive odor into a fragrant aroma. Some Illinois people in moving south into Missouri have held their noses, yet when they get a taste of Missouri as it is, not as it is reputed to be, a great transformation takes place, then one becomes so attached to Missouri that you could not chase him out of the state with a hound. Missouri is a great state; it is a great fruit state; perhaps I should say from experience this year it is a great fruit tree state. It has more than 25,000,000 apple trees. It is said that Arkansas raises more hogs and less pork than any other state in the Union; for this year it must be that Missouri has more fruit trees in it and less fruit than any other state in the Union, except it be Kansas, where the adverse winds blew all their fruit away.

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Last February I attended the Wisconsin State Horticultural meeting by invitation and spoke on "Organiaztion for Selling Fruit." A little later I received a letter from Mr. Lloyd, your Secretary, asking me if I would come to Illinois to your winter meeting and speak along the same lines. I wrote him expressing my willingness to come. Arrangements were finally made and I am here. What I shall have to say will be a reproduction of my Wisconsin speech, with some additions and subtractions, which are due entirely to the law of evolution. This is an evolutionary age in which we live. The man that does not evolve a little in a year is a fossil.

It is coming generally to be believed that it is best for fruit growers to co-operate in selling their fruit. There are exceptions to the general rule. If a man is a capable business man, if he is an intelligent fruit grower, if he thoroughly understands all the details of the fruit business, if he understands what and how, to plant, if he understands the best methods and the objects of cultivation, if he understands how successfully to combat insect pests and fungus diseases, if he understands how properly to thin, prune and feed his fruit, if he understands how to gather, grade and pack it, if he understands what kind of packages to use, if he understands what markets to put his fruit into, if he knows how to deal with track buyers and commission merchants, if he has a good reputation in the markets for honesty and the production of fancy fruit, if he knows how to collect his returns promptly and use them advantageously, and if he grows fruit on an extensive scale, then he would do better to ship independently and not to co-operate with his less intelligent and less skillful neighbor. But such a man is rarely found. Hence the general rule stands true.

The cotton growers of Texas organized to sell their cotton. The grain growers of Oklahoma organized to sell their grain. The truck growers of the south organized to sell their truck. The fruit growers of the far west organized to sell their fruit. All these found it to their advantage to do so. Through their organization they both lowered their shipping expenses and raised the price of their products. Craftsmen and tradesmen of many sorts and kinds have formed themselves into unions and federations of various sorts and names to raise the price of labor, and beyond all question they have raised it. They have raised it so high that a farmer can hardly hire a man at all. Fruit growers cannot afford to be one whit behind the very chiefest of American producers in the matter of concentration and organization. The more complete the organization the more complete the advantage.

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Down at Neosho, Mo., where is my home, we have an organization of fruit growers that has been fairly successful in its business, and has made a good reputation throughout Missouri and in all the markets where it has done business. Let me speak of that organization, of its workings and results. I will not ask your pardon for talking about ourselves, for using personal pronouns, for I know it is personal experience you want to hear. Indeed, I was invited here by your worthy Secretary to do that very thing. I would be "disobedient to the heavenly vision" if I did not do so. The only excuse I have to offer is, I have a divine call to speak that I do know and to testify that I have seen.

We have an organization of about 140 members. It is mainly a strawberry organization, its work being almost exclusively the growing and shipping of strawberries. We have been organized about eleven years. At one time we had nearly 200 members. Some have died, some have moved away, some have lapsed and some have collapsed. About 140 remain to keep up the business. I have the honor at present to be the president of the organization. The officers of our society consist of president, vice president, secretary, treasurer, and a business committee of five, one of whom is corresponding secretary and business manager. We used to pay our business manager two per cent of the gross sales of our fruit. Out of that amount he paid his assistant, the bookkeeper, the inspectors at the loading station and all the helpers that were necessary to load the fruit upon the cars. When all these were paid there was left the manager about $1,000, sometimes a little more and sometimes a little less. Now we pay the manager one per cent of the gross sales. He pays none of the expenses just referred to and the association pays them all. We prefer paying a commission to paying a salary for three reasons: the commission has a tendency to stimulate the manager to do his very best for the growers, for the more fruit he can sell at a good price the more he will make for himself. In case of a shortage of crops he will fare and fall with the rest of us, and in case of a total failure we will not have to go down into our empty pockets and "dig up" to pay him for work which he did not do.

We put upon our *business committee* men of good judgment, men of recognized business sense. We select for our manager a man of demonstrated business ability, a man in whom the association has the utmost confidence, both in his competency as an agent and his honesty as a man. The business committee hold meetings as often as they think necessary to look after the interests of the association. They consider every subject thought to be of importance to the growers. They provide the growers with box

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and package material. They provide them with stamping outfits and every grower is required to put his personal stamp on both ends of every crate, together with the variety stamp and the grade. On every crate of the "A" grade the manager puts the association trade mark, a copyrighted stamp, which is the association's guarantee of high quality. They provide the growers with *tally sheets* with which to keep the account of the berry picking. They provide them with picker's and packer's rules, with bills and posters for advertising for pickers, and with all other needed supplies. They make arrangements beforehand with commission merchants to handle our fruit the ensuing season. They know before the berries are grown where the bulk of them will be marketed. We never sell to track buyers. We always consign to commission merchants. We have demonstrated to our satisfaction that it is to our advantage to do so. We get better prices than most of our neighbors who sell on track. We stand by the commission people in the beginning when the berries are the best, and they stand by us in the end when they are the poorest. Then the track buyers would desert us. The business committee *arrange with the railroads* for their share of the business. They arrange for plenty of refrigerator cars. They arrange for re-icing cars in transit. They arrange with electric light and telephone companies for their services at the loading shed. They arrange with numerous men for their services as bookkeeper, inspector, loader at the shipping station, or instructor in the field. They look after all the details of the business, having authority to attend to it just as though it were their own.

We have a *constitution and by-laws* by which we are governed. In it is specified who may become members and upon what conditions they may remain. In it are pointed out the duties of the officers and members. In it is pointed out how the officers are paid for their services and the growers for their fruit. The secretary and treasurer are each paid $25.00 per year. The members of the business and auditing committees are each paid two dollars per day for services actually rendered. The manager is paid one per cent of the crop, and the president is paid in glory. The growers are paid their pro rata share of each day's sale. To illustrate: Suppose five cars are sold. One goes to Kansas City and sells for two dollars per crate, one to Omaha and sells for $2.25, one to Denver and sells for $2.50, one to Minneapolis and sells for $2.75, and one to Duluth and sells for $3.00. We find the total net value of the five cars and the total number of crates in them. We divide the total net value by the total number of crates and the quotient is the average price per crate and that is what the

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growers are paid. And so on to the end of the season. *In the by-laws* it is specified that the growers must deliver all their fruit, which they have to sell, to the manager and that they must not pay more than the association price for picking, which is 1½ cents per quart. In it is specified that the fruit must be carefully graded "A" and "B" and that if any does not meet the requirements of the "B" grade it will not be shipped at all. The only difference between the two grades is size. The "A" grade must be large. The "B" grade may be smaller, of medium size. But the little, dinky, buttony or warty berries must not be packed at all. All berries to be shipped, whether "A" or "B," must be sound, well shaped, well colored and clean, and the measure must be scriptural, "pressed down, shaken together, heaped up, and running over."

Having thus *briefly outlined* the workings of our organization, I will now speak of some of the advantages of organization and the problems it solves. An organization has the advantage of selecting its market agents. It can select from among its membership an executive board of good business men, and a business manager, courteous in manner, shrewd in method, and accomplished in the ways of doing business. It is one thing to grow fruit. It is quite another to market it successfully. Fruit growing is a science. Fruit selling a fine art. Fruit growing depends upon definite, fundamental, unchangeable principles. Fruit selling depends upon uncertain, superficial, fluctuating conditions. In fruit growing one must study climates, soils, locations, varieties, planting, cultivation, pests, diseases, remedies, picking, packing, storing, delivering, and such things. In fruit selling one must study men, railroad companies, express companies, refrigeration companies, cities, panics, the condition of markets, industrial conditions, distribution of wealth, the standing of commission merchants, supply and demand, and such things. Fruit growing and fruit selling are two very different classes of business so that a man might be a perfect success in one and a perfect failure in the other. For this reason we select for our business manager a wide awake, thorough, capable business man. He is our selling agent. Daily with his hands upon the wires, his ears at the phone, his eyes upon the market reports, and both his feet in the business up to his shoulders, he studies the markets, gets in touch with them, and sells the fruit. The rest of us, being relieved of that responsibility, study how to grow fruit, give our undivided attention to its production. This is a decided advantage.

An organization has an advantage in being able to make better and more satisfactory *banking arrangements* for its mem-

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bers than they could make for themselves independently. Most any bank is willing to do business with fruit growers. Through the influence of the officers of an organization a bank will favor the members when they apply for an accommodation. It will lend money to them, taking their personal notes, if to them is attached an order to the business manager to pay off the note out of the first money received for the grower's fruit. This is an advantage to many growers, as it enables them to buy their package material in the winter when they can get it at a discount and have time to make it up. Further, during the picking season, if a grower wants money to pay his help before he has received his returns for his fruit, banks will advance enough to pay all expenses and generally without interest. This makes it easy for the growers to accommodate their pickers and other helpers, without any trouble or embarrassment to themselves. These and other similar banking arrangements we have made at Neosho and are the results of organization.

An organization can *buy package and spray materials,* fertilizers, seeds and other supplies cheaper than an individual. This is one of the chief advantages of local organizations. Some associations use as much as ten carloads of crate material in a single season. By buying this amount in a wholesale way of one factory at one time it can be bought for less money than the same amount can be bought in small lots of a local retail dealer by individual growers. By buying in such quantities jobbers are brought into close competition and they cut one another's prices. Competition brings prices down until the factories form a trust and then prices are uniform. This trust business will drive the growers some day to own and operate their own mills, and when that time comes, material can be bought cheaper than now. By buying wholesale, Neosho saved last year to the growers about $800. In the same way, the Hood River Apple Growers' Union saved last year to the growers $7,500 on their apple boxes, paper and spray material. In the same way, the fruit and vegetable growers of Alvin, Texas, not only saved many dollars on their box material and fertilizers, but reduced the price of their farm seeds one-half. Many other fruit unions throughout the country have sought and found the same advantage, and some western unions have recently been formed with this item especially in view.

By co-operation we have *improved our shipping arrangements.* We have reduced our shipping expenses and gained a better market for our fruit. Before our organization, the growers shipped independently in small lots by express to nearby towns. But express charges are high, much higher than freight rates. By co-operation

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we combine the small lots of many growers and are able to ship in car lots under refrigeration to distant cities. This secured us cheaper rates and higher prices. We cannot afford to ship by express to distant markets for two reasons: First, the charges are prohibitive; and, second, the berries will not stand up and reach the market in good condition in heated express cars. Besides fruit shipped by express is sometimes very roughly handled. Expressmen have been known to pitch crates of fruit about in reckless fashion, breaking the crates, smashing the fruit, and swearing at the wreck. But in a refrigerator car the crates are slatted and nailed, staunchly braced, well iced and ventilated, and in such condition can be shipped across the continent to the best markets in the land. Thus through co-operation in carlot shipments rates are cheaper, temperature lower, the handling decidedly better, distant markets can be reached, fruit arrives in better condition and higher prices are secured. Apple growers are not so much benefited by refrigeration as berry growers, but even they are benefited by the reduction of rates in carlot shipments, in the better handling, and in the better prices of the distant markets.

We have secured *better shipping facilities and better railway service* through organization. We have two railroads at our place. They both have lines to Kansas City, our great distributing center, one direct and the other indirect. We do business with both roads. The rates are the same, but the service is different. While there is no competition between the roads, no cutting of rates, they both solicit our business. They can well afford to solicit it, for some years it is equivalent in profits to the railroads to the hauling of five hundred cars of lumber, and it is all done in less than thirty days. While we do business with both roads, the bulk of it is done with one, because it is more accommodating than the other. It has built for us with a little of our help a loading shed nearly 200 feet long, at which five cars can be loaded at a time. It gives our cars in transit more attention than the other. It keeps its promises to us better. It pays our claims more promptly and fully. It treats us with more courtesy and consideration. It tries to rush our berries to market with all possible expedition. At our solicitation it put on a special strawberry train. That train begins to pick up cars in Arkansas and closes up with our station at midnight. Then it heads for Kansas City, our great distributing center.

There it hitches on to a fast Armour meat train which hauls our fruit to Minneapolis and other northern cities twenty-four hours quicker than the old way. That quick handling of our strawberries has been a great help to our association. It has put

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our fruit into the market in better condition and has given us the advantage of an earlier and higher sale. In many sections of the country, other roads have put on special trains to haul strawberries, peaches, apples, oranges and other fruits. Even passenger trains have been sidetracked to give these fruit trains the right of way. This service has been highly beneficial to the growers everywhere, and these results could not have been obtained but by concerted action.

One of the most serious problems that confront the fruit grower is that of *transportation.* This is particularly true of those who, on a large scale, handle fruit that must be marketed quickly or sent a long distance. It sometimes amounts to vexation, agitation, exasperation and vituperation all in one. Railroads fail to supply cars when needed, and thousands of bushels of fruit perish at the station. Cars are delayed in transit and not re-iced, and the fruit perishes on the way. Fruit is hauled from noncompeting points, and disproportionate charges are made. Fruit is discriminated against everywhere, and exorbitant rates are established. Almost every article of commerce of equivalent value is hauled cheaper than fruit, and some of it five times as cheap. In some instances the roads get more for hauling the fruit than the growers get for the fruit itself at the loading station. It costs as much to ship apples from north Missouri to Central Iowa as it does from New York to Iowa. It costs as much to ship apples from South Missouri to Texas as it does from New York to Texas. It costs as much to ship a car of fruit from Monett, Missouri, to St. Louis as it does from Hood River, Oregon, to St. Louis, although the distance from Hood River is eight times as great. It costs twenty cents a hundred to ship a car of meat from Omaha to Chicago; it costs forty-five cents a 100 pounds to ship a car of grapes from Omaha to Chicago. It costs $15.00 to ice a car of meat from Chicago to Los Angeles, Cal.; it costs $60.00 to ice a car of fruit from Los Angeles to Chicago. Transportation rates throughout the country are unequal, unfair, and unjust. Do fruit growers have any grievance over these matters? And how can they get redress? The best way to seek adjustment is to do it in an organized way. The peach growers of Georgia organized and went after the railroads through the legislature, and they brought them to terms. The Armour Company paid the growers in full for their lost fruit, and the roads agreed to furnish cars in the future when needed, or pay for the fruit and besides a forfeit of $50.00 a car. I am glad to note that the Western Fruit Jobbers' Association and the Ozark Fruit Growers' Association, in a sensible way, and in

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the only practical way, are taking up the matter of transportation rates with the interstate commerce commission. They expect to lay the facts before the commission, and they seek the co-operation of fruit and vegetable associations throughout the country in gathering the facts. Now if such organizations would act promptly and energetically, and respond to the Jobbers' Association with such facts as they may know, there would be some hope of relief, there would be some promise of securing fairer and more consistent transportation rates.

I pass now to consider some matters which some may think are not relevant to the subject in hand. Directly they are not. Indirectly they are. In days agone a celebrated cook book contained a recipt for cooking a hare. In the introduction the author said, "First catch the hare." Catching and cooking are closely enough related to be included in the same receipt for cooking a hare. So growing and selling fruit are closely enough related to be included in the same receipt for selling fruit. Through organization growers are stimulated to adopt better cultured methods for the production of their fruit. In our association, after the routine business is disposed of, we are in the habit of discussing some phase of fruit culture. He hold experience meetings, in which we relate our ways of doing things, our successes and our failures. We have a kind of correspondence school, in which the aged teach the young; in which the initiated instruct the aspiring; in which the veteran guides the new recruit. The most experienced and successful growers are called upon to tell how they prepare their fields for the planting of a new bed, how they plant, how they cultivate, how they thin, how they renew an old bed, how they produce fancy fruit like true Missourians. They tell all these things and show how they do them, and thus we learn the better way from one another. Besides, we visit one another at different seasons of the year, look over one another's fields, and study one another's methods. When we know a grower has a particularly good field and that he has marketed a specially fine crop of particularly fine berries, we go to his field to see what he has done and how he has done it. In this way we catch on. When we come in contact with a patient who is breaking out with a pronounced case of measles we catch the disease and have a spell of it ourselves. So when we come in contact with a man who is breaking out with a pronounced success in growing fruit, due to good cultural methods, we catch the good health, adopt the better method, improve our own ways, and produce better fruit. The best orchardist in my locality, the one that grows the most good fruit per acre, whose apples are the nearest perfect, the smoothest, the freest

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from scab, and rot, and codling moth, who sells his crop the soonest and for the best prices, is a man whose cultural methods are the best. He gives his orchard the closest attention. He works in it by day. He sits up with it by night. He sprays it thoroughly. He prunes it scientifically. He cultivates it intensively. He applies commercial fertilizers and barnyard manures abundantly. He grows leguminous crops in it occasionally. His packing of his orchard product is no better than some others. His working out of that product is more progressive, more intensive, more scientific, and more successful. The moral to this story is, be at pains to grow good fruit and that in turn will grow a good price. "Whoso looketh into the perfect law of fruit culture and continueth therein, he being not a forgetful hearer, but a doer of the work, this man shall be blessed in the market." Good fruit will always sell and generally it will sell readily and at the highest price. It's the sorry fruit that slumps the market and sells slowly, that disgusts the consumer, that exasperates the commission merchant and disappoints the producer.

This leads me to say that organization stimulates the growers to do *better grading and packing*. If there is any one thing we give more emphasis to than another in our association it is this; that we should be very careful and painstaking in grading and packing our berries. We print rules for our pickers and packers and tack them up on and in the packing sheds to teach them how to do the work. In the association the growers themselves are instructed upon this subject. In the farm sheds the growers give this matter their personal attention, or commit it into careful hands who do the work faithfully and well. Inspectors are sent out by the association to the fields to see how the work is done by the individual growers, and to show them how and where to make improvements in their packing. We do not send a teacher to show the growers how to set out their plants, how to cultivate, how to hoe when their fields are weedy, how to thin when their plants are too thick, nor how to mulch to keep their berries clean. From reading and observation, from original thinking and practice, they learn how to do all these things, and they do them just as they please. But we do send a teacher to the farm packing sheds to instruct the growers how to pack their fruit, and they must pack it to please the management. And further, inspectors at the loading station open every crate and if the berries do not meet the requirements of the pack, they are set aside and not shipped. These things cause the growers to be very careful to pack their fruit well, so that it will bear the most rigid inspection. In this way, we get practically a uniform pack, so nearly alike in fact, that a

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stranger at the loading station seeing the fruit come in from 140 farms might think it all came from the same farm. In this way we put a pack upon the market in 1906 which enabled us to get the highest average price of all the berry associations in Missouri and Arkansas which shipped as many carloads as we, or whose shipping period was co-extensive with ours, and this year we got thirty-two cents per crate higher. We have a commission house in Denver, Colo., which has handled our fruit for years. It is one of the most celebrated in the west. One year at the close of the berry season they wrote us, saying: "Your berry is second to but one, the Hood River berry, the best berry in the world." One year later, after having another year's experience in handling our berry, after becoming a little better acquainted with it, they wrote us again, saying: "Your berry is the equal of the Hood River berry." One more year later, after having still another year's experience in handling our berry, after noting its size, after seeing its beauty, after testing its quality, after demonstrating its salability, they wrote us once more, saying: "Your berry is the superior of the Hood River berry which we had thought was the best berry in the world." We are proud of this record. It is not only complimentary of our work, it gets us the money. After the close of our berry season this year, I asked our commission house at Kansas City how our berries compared with the berries from other shipping points. They said : "You are not so far ahead as you used to be." I asked them how that came about. They replied: "You have taught the southern associations what berry to grow and how to do better packing and they are catching up with you." Yes, the southern growers are getting better prices because they have been stimulated to grow better fruit and to do better grading and packing.

Another illustration of what can be accomplished by high class work in packing is the Hood River Apple Growers' Union. The growers of that union do not pack their own fruit. It is packed by the union. The union employs expert packers and one expert is placed with every orchard crew. That crew works under his direction. In this way they get a uniform pack. And how do they pack their fruit? They pack it in boxes, not barrels. The boxes are lined with white paper. The apples are nearly uniform in size. Each apple is a perfect specimen. Every apple is wrapped separately in a printed tissue paper. The apples are packed in tiers and rows. A blue layer paper is placed between every two tiers of apples. The tiers are all alike. The bottom tier is as good as the top one. The middle tier is as good as either top or bottom. A blue layer paper is laid upon the top, and some of the growers

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lay upon that a mat with their monogram beautifully printed in letters of gilt. On the ends of the box a label is put, a beautiful label, a work of art, the picture being a reproduction of the Hood River apple, the Spitzenburg, in size, color and shape. The sight of that picture makes one's mouth water and him to imagine he scents the fragrant aroma and tastes the delicious flavor of that prince of western fruit. No marvel, if they pack apples in that style, that they get calls for them in Klondyke, in New York, in Vladivostock, and in heaven, and that they get prices that are the wonder of the world. In 1902, before their organization, the individual growers sold Spitzenbergs for eighty-five cents per box. In 1903, the first year after their organization, the union sold Spitzenbergs for two dollars per box, and every year since that they have raised the price until 1907 when they sold their crop of Spitzenbergs for $3.27½ per box, equivalent to $9.82½ per barrel. At the rate they are now going, if not providentially hindered, in 1910 they will all be riding in automobiles and distributing their apples at five dollars per box or ten cents a smell. They attribute their high class packing and their astonishing prices to their organization. I do not say that all apples should be packed in this way and sold for these prices. In fact I am glad they are not. If they were the common people would be expelled from the garden of economy for eating such forbidden fruit, and banished to the cheerless realms of millionaires. I would prefer that Ben Davis apples should be so perfectly grown and so well packed that they would sell readily for three dollars per barrel and be so plentiful as that the children in the cities and the hogs in the country could get some to eat—if they could put up with the quality. What I wish to emphasize is, that good honest packing will pay the grower every time.

Another advantage of organization is *specialization.* I believe in specialism. The association I represent believes in it. There are several berry associations in Missouri and apple associations in Oregon that believe in it. Jesus Christ Himself was a specialist. He said: "To this end was I born and for this cause came I into the world, that I should bear witness unto the truth." Paul, the great apostle to the Gentiles, was a specialist. He said: "This one thing I do." Five years ago we grew a dozen different commercial varieties of strawberries. One of our growers experimented with thirty-six varieties. But we found it confusing to the pickers. They did not all ripen at the same time. They were of different sizes, different shapes, different colors, different carrying quality, and had to be picked in different ways. It was hard to teach the pickers how properly to pick the different varieties.

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It was a hard lesson. It was difficult to the packers and inspectors. It was very troublesome to the salesmen who sold the fruit in the cars. So the force of these circumstances drove us to the selection of one variety of berries, the one most adapted to our soil and climate, and which we can grow to the highest degree of perfection, and to give almost our entire attention to the production of that variety. We have practically made our reputation on that one variety. Hood River, Oregon, made its reputation on Clark's Seedling. Logan, Mo., made its reputation on the Gandy. Vanburen. Arkansas, made its reputation on Mitchell's Early, and Neosho, Missouri, made its reputation on the Aroma. All these made such reputations as they have by being specialists. There are many stock breeders throughout the country who have achieved great success by giving their entire attention to the growing of one kind of stock, such as Percheron horses, Durham cattle, Duroc-Jersey hogs, and Plymouth Rock chickens. I would not limit orchardists to one variety of apples and peaches, but I would limit them in commercial growing to a very few popular varieties and to such varieties as are best adapted to their soils, climates and locations. It is much easier for an organization to handle one variety of good fruit than a dozen of common fruit. On this account the tendency of organization is to specialization.

There is *one great problem* in the fruit business which organization is slowly working out and which it will eventually solve, and that is the problem of disposing of our unmarketable fruit, our culls, our windfalls, our left overs, our immature and rotten fruit, much of which at present is lost. In my neighborhood in 1906 one orchardist lost 3,000 bushels of refuse apples. They lay upon the ground and rotted. Another lost 2,000 bushels. So it goes all over the country. What shall be done or what can be done with this class of fruit? "Gather up the fragments that nothing be lost." Learn a lesson if you will from the great packing establishments of the land. We send to them many thousands of cattle and hogs every year. At home in butchering them we throw away the hoofs and the hair. We throw away the heads and horns. We throw away the offal, the entrals and the bones. But at the packing house they throw away nothing—they utilize everything, except possibly the squeal, and some of these days some Yankee will find some way of saving that and throw it upon the market as rag-time music. They put everything through a process of some kind, convert it into a by-product of some sort, put it upon the market somewhere and sell it at a profit. That's the result of organization and the application of good business principles to their enterprise. Fruit growers need to organize in their

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several localities and build canning factories, evaporators, cider presses, vinegar plants, fruit juice and butter factories, cold storages, ice plants, warehouses, and plants for the distillation of denatured alcohol. They need to pack their No. 1 and 2 apples for storage and market, and all other grades they need to bring to these plants, convert them into desirable by-products of some kind, put them upon a craving market and sell them at a profit. In this way we, too, can "Gather up the fragments that nothing be lost." These things are coming. They have already reached some localities. Just here I want to take off my hat to the enterprising fruit growers of Arkansas. Did you ever hear about Arkansas? They do not have as many level acres of wheat land as they do in the windy state of Kansas. They do not have as many fine mules as they do in the uplands of Missouri. They can not grow as many bushels of corn per acre as they can in the black lands of Iowa. They do not raise as many blooded and pedigreed hogs as they do in the rich lands of Illinois. They do not have as many fine graded schools as they do in the cultured state of Indiana. But they do have a rising generation of progressive fruit growers and they are leading the horticulturists of all those states in the matter of saving the wastes of the orchard. They have organized, and installed many plants for the manufacture of various kinds of fruit products. Here they take their inferior grades of fruit and make them up into useful commodities. They keep these grades off the market and that prevents gluts and gives them a better price for their better grades of packed fruit. In time they will put these manufactured products upon the market and get valuable returns. Yes, these things are coming. We await their general arrival with a great deal of hope. We look to organization to work out this problem and when it is wrought out, and it must be, then the millennium of fruit growing will be at hand. Then commercial orcharding and general fruit growing will be less wasteful and more profitable.

In conclusion let us not lay again the foundation of individualism, of separatism, of every man for himself, and his majesty after us all, but joining hands with our neighbors, let us adopt better cultured methods for the production of fancy fruit, better protective measures for its defense against its natural enemies, and applying better business methods to save the wastes and prepare the perfect product for a profitable market, let us go on towards perfection in growing and marketing the golden products of the orchard and field. Forgetting the things that are behind, the bad seasons and worse management and reaching forth unto the things that are before, good seasons, better business principles,

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and the best of markets, let us press steadily forward towards the high water mark for the prize of the high calling of God in the delightful and ennobling science of horticulture.

Discussion on Mr. Graves' Paper.

Mr. Besly—Mr. Graves says they combine to regulate the price of labor. How do they escape the laws against combination?

Mr. Graves—I have reference in this, to the amount that we pay our pickers for picking a box of strawberries, and that we pay them one and one-half cents for doing that. The object we have in doing that is to avoid confusion. It confuses pickers and it confuses growers to have a variety of prices for that particular work, but while we establish that price we pay our help more than they could get at anything else for that class of labor, and consequently if we pay them a higher price than they can get at any thing else they are not likely to bring the law down on us.

Mr. Besly—Then the answer is, so far the lightning has not struck you.

Mr. Graves—Has not struck us.

CANE FRUITS.

G. W. Endicott, Villa Ridge.

To the Members of the Illinois State Horticultural Society:

Your Secretary has commanded me to write a paper on Cane Fruits, and I suppose he was actuated in this course, by the old adage that the less a man knew the more he would say. When we have men in this State that grow cane fruits by the hundred acres, it seems like sacrilege to call on a man who has always been contented with five to twelve acres.

While this paper may be somewhat rambling and disconnected and may have the flavor of how I did it, like all other horticultural papers, still there is a good chance to correct any errors, in the discussion.

And in making my little "spiel" I will only treat on the growing of red and black raspberries and blackberries. As it

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seems to be an impossibility to grow currants and gooseberries south of latitude 39, only in some especially favorable locations, and as I know nothing about them, I shall leave them out.

To grow cane fruits successfully, the soil must be rich, and well supplied with humus, and free from a stock of weed seeds, and to have it so it should be planted in corn and well cultivated one year and the next year it should be sown in cow peas about the first of June, and when the first pods begin to ripen they should all be turned under very deep and the whole mass rolled down solid. This is especially necessary if you wish the tops to rot good so you can plant in the fall, which I think from twenty years experience is the best time to plant the red raspberry, as the dirt settles close to the roots and they start earlier in the spring.

This fall planting only applies to Southern Illinois as it would be risky to plant at that season, in the north where the ground freezes to a great depth, and they would be likely to winter kill.

The distance to plant has been a mooted point with many planters. Some want to plant four to five feet between the rows and three feet in the row. I have noted that the outside rows when planted close always had about double the crop that the inside rows had. So I have made it a point to try to give all the rows the advantage of the outside row, by planting the rows full seven feet apart and planting two feet on the row. This is a little close for the strong growing varieties but it makes a good average distance to plant.

The planting in these wide rows has many advantages. You can get through them with a wheel horse rake by taking out some teeth in the middle to clean up the brush and then you can drive a narrow gauge wagon through to haul out the brush without bruising the canes.

Planting.

It goes without saying that you want nothing but the best No. 1 plants, dug and handled so they will be exposed to the sun and wind for the shortest possible time; they must be kept moist all the time they are out of the ground. To lay off your ground there is nothing better than a good two-row corn planter that makes three and one-half foot rows; just run in one of the old tracks every time and then use each alternate row. Now you are ready to apply your fertilizer, which should be composed of medium fine ground bone and muriate of potash; two parts bone and one part

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of potash, and 500 pounds to the acre is about the right amount; this should be sowed along the rows you plant in, and spread about three feet wide.

Open the rows with a one-horse turning plow by going twice in each row, then start your planting right in the fresh furrow. Have a boy (or better, a man, if you are planting two rows at one time) with the plants in a wet sack to place them in the furrow and a man with a hoe to cover them at once; it is not necessary to fill the furrow with the hoe, just cover the roots well and see that the tops are in nearly a straight line, as the furrow can be filled with a plow in good shape. When all are planted fill up your furrows, tramp well and cut off all the tops down to two inches.

Now for the cultivation the first year. Start the cultivator at once and keep all weeds down and the crusts broken after every rain, but do not ridge up much; keep this up to the tenth of July, then sow one and one-half bushels of some bushy cow-peas, harrow them in nicely and bid them good-bye so far as cultivation is concerned.

As to pinching, I always do that when they get ten to twelve inches high while the wood is soft; they will send up four to eight nice shoots that are not likely to be blown off by the high winds. while if they are pinched at two or two and one-half feet they will only push two or three shoots and they will grow three or more feet long and the high winds and sleet will have more than half of them broken off by spring. Then the old stub will only push two or three shoots that will grow up tall and the wind will break many of them off, and your crop will be short, while the young shoots will push nearly every bud.

The second year I don't pinch at all, as the new growth is slimmer and thicker so the canes protect each other. The cultivation the second year can all be done with a four-foot disc harrow, and I prefer a double action cutaway to any tool I have ever used. (I would never use a turning plow or the long pointed double-shovels in a red raspberry field. I have seen many fine plantations just plowed to death, by cutting off all the young feeding roots.) This cultivation with the disc should be kept up about every two weeks, till the first berries begin to ripen, then leave out the disc till you are done picking the berries, but while you are picking run a one-horse harrow through the rows every other day, to mellow up the ground that is packed down by the pickers' feet.

As soon as the fruit is all gathered, go in with the disc and give the middles a thorough good working, clean out the rows with

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a hoe, and as soon as you get that done, sow one bushel of No. 1 cow peas per acre and harrow them in with a one-horse harrow; then bid the field good-bye. All the above has reference to the red raspberry, but it will apply just as well to the black caps as to the reds, only the rows should be eight feet apart and the plants three feet in the rows and the pinching the second year and thereafter, at two feet. This plan of cultivation should be kept up each year while the plantation is in fruit.

Now a word or two about the blackberry. The soil need not be so rich in nitrogen as for the raspberries, but it must have good drainage and be loose and mellow; the plants should all be number one root cuttings, grown one year in nursery, and planted just the same as the raspberries only they should be set as early as the ground will work good in the spring (never plant in the mud). Set the plants three feet in the row and the rows full eight feet apart. Cultivate thoroughly the first year till late in July and then give them the cow-pea treatment, just the same as the raspberries. And right here I want to note that the time to sow the peas will vary with the latitude, the tenth of July is right for Alton and Effingham, while we can sow fifteen days later.

Blackberries need no pinching the first year; let the young plants run up as high as they will, as they need all the foliage that sets to make a good root growth, and it stunts them to pinch the first year.

Pruning.

The first year cut them back to about eighteen inches, and tramp all the brush down between the rows, and leave it there, then when you get your raspberries pruned and the brush and pea vines raked up, haul them and fill up between the blackberry rows about one foot deep when they are well tramped down. This mulch treatment should be kept up each year while the plantation is in fruiting. There should never a plow of any kind be put in a blackberry patch after the first year.

This raspberry brush and pea vines makes the best mulch I have ever found, as the brush soon rots and holds the mulch up loose so it does not pack down and sour the land like straw or forest leaves, and it does not fill the land with foul seeds. Once or twice through the summer take a scythe and cut the young growth that comes up in the middles, then you will have the ideal cultivation for blackberries.

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I have in mind a little patch of four rows, just one-eighth of an acre, that yielded forty-two twenty-four quart crates this year, and it was the eighth year in fruiting. This was a remnant of a large patch; the rest of the patch had been cultivated scientifically, each year, and all except the four rows was killed out with the rust five years ago, while not a speck of rust has been on the mulched rows, and they look good for eight more years. You will need about four acres of raspberries to mulch one acre of blackberries.

The pruning after the first year can be done with a Waters tree pruner with a six-foot pole. This is the best pruner I have ever found, as you can cut out all the old wood and pull it out with the hook.

Varieties.

Now a word about varieties. I have fruited nearly the whole list and have never found anything so good as the "Early Harvest" for profit; the Illinois comes next and is a close second. Earliness cuts a large figure in this matter, but good shipping qualities must be considered.

Varieties of Blackcaps can soon be gone through, as there is nothing but the Cumberland to be considered, and in six years I have never seen a sign of anthracnose on it, while all the other varieties have been ruined by it.

There is no disease that hurts the red raspberries, except the "root gall," and that is a holy terror on many varieties; none are entirely exempt, but some are more resistant than others; among these are the old "Turner" and the "New King," with the "Cardinal" almost in the same class. Among the non-resistant are, in the order named, "Louden," "Brandywine," "Miller," "Cuthbert" and "Ruby." These should not be planted in ground that is in the least affected.

As to the strong and weak points in many of these varieties I will say a word or two. The Miller is strong as a shipper and that is all that can be said of it, as the quality is wretched. The New King is fine in quality; is a good shipper when the weather is dry, and will yield with any of them, except the Haymaker and Cardinal class (these are too dark in color to suit the market for reds). The weak point in the King is that it does not stand our warm, wet winters. Louden is fine in quality, but the root gall gets it the second year. The same can be said of the Cuthbert and Brandywine.

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There is lots of land in Illinois that is rich enough in nitrogen to grow good raspberries, but I have never seen any land in the State that had enough phosphorus or potassium to grow raspberries to their best estate. I know this is heresy to the folks up in the Corn Belt, but it is true just the same. You must have an abundant supply of phosphorus to get the large, plump berry, and you cannot have high color and solidity without a large supply of potassium.

DISCUSSION OF MR. ENDICOTT'S PAPER.

MR. HUBBARD—I would like to know if you have made any experiments with phosphorus?

MR. ENDICOTT—Yes, I should think I had; that is, I have been using it for fifteen years in the shape of medium fine ground bone. One word I want to say about applying phosphorus in the shape of ground bone is, that it is a material that does not form any combination in the soil; there is no sulphuric acid with it and it all becomes, sooner or later, available; it dissolves gradually in the soil and lasts four or five years, as long as the crop will. You can buy basic slag or any of those phosphorous preparations with a large proportion of sulphuric acid in it, and the combination in our soil at least renders that entirely insoluble. I fell back on bone. As long as I can get it at less than $30 a ton I will never use basic slag, nor rock dissolved.

MR. PERRINE—How about the raw rock?

MR. ENDICOTT—Raw rock is too hard to get any good out of it, it takes too long, it is too slow. It is excellent material, the phosphorus in it is all right enough, but it has got to be dissolved with acid, or else you have got to use it in your barn a year or two before you can get it onto the field. Dissolved with acid it forms a combination that only makes the phosphorus available for one year. I have tried that thoroughly; if it is dissolved with acid it is ruined after the first crop, and your raspberries will have no fertilizer for the next four or five years.

There is land that is inclined to be sour, very sour. On those lands the rock does less good than it does land that is inclined to be more or less sweet, or more or less acid. Through our hill lands we do not have excess of acid, unless we plow down two or three crops of peas or green crops in succession. If you plow down two heavy crops of cow peas we have an excess of acid, otherwise we do not have any excess to do any harm.

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MR. AUGUSTINE—The paper states that the Early Harvest blackberry is a great bearer and the only bearer, so to speak, but with us we do not get a crop scarcely once in five years of the Early Harvest blackberry; that is, what we plant for the Early Harvest. We must always consider locality.

MR. HARTWELL—We could not plant the Early Harvest blackberry at all.

MR. DUNLAP—In considering this matter of variety, we ought to remember Mr. Endicott's locality in the extreme southern part of the State in connection with his recommending the Early Harvest. The Early Harvest up here very often winter kills and we ought to bear those things in mind.

MR. HUBBARD—I would like to ask about the Early Harvest. I have had questions asked about it, and I have talked with two growers in our locality perhaps two miles apart who have the Early Harvest; one says it does not crop but every other year; another says it crops every year; another man from Savanna says it crops every year. It seems to me there must be two kinds of Early Harvest. I would like to ask, does it fruit as early as the Snyder?

MR. GOODRICH—I might say for Union county, we know of but one variety there; it always produces and produces well, and as Mr. Endicott says, it is the only one that is profitable with us. The trouble was, this year, it was entirely wiped out by the rust; we could not control it. It was a good producer and the most satisfactory one we had.

MR. NEELEY—I grow the Early Harvest blackberry just for my own use in the garden. We had the rust in them and I cut it out and mulch them, do not cultivate at all; I do not mulch them as heavily, and I have fruited one little patch of these blackberries for seven years and the rust is gone and it is still bearing, bears every year. I do nothing to them, only trim them out, tramp down weeds and briers carefully every spring, and then instead of cutting them I go in there with some instrument and tramp them down; that is all the cultivation it gets. I got rid of the rust by cutting it out. That is in Williamson county, next to Union.

PROF. BLAIR—Mr. Endicott, does the Early Harvest crop every year, and does it fruit as early as the Snyder?

MR. ENDICOTT—The Early Harvest, in treating it with mulch, is the best annual bearer I have, except the Illinois, and properly handled it will produce as much as the Illinois, practically. It is

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a better shipper than the Illinois, grown on our soil. The piece that I speak of in my paper has fruited this year the eighth time, it never has missed a crop, and in the eight years we have had the mercury seventeen degrees below zero. We never lay anything down. With mulch treatment and good drainage I am satisfied they will stand twenty below zero.

MR. PAISLEY—Mr. Endicott, do you think cultivation is always preferable to mulching for raspberries?

MR. ENDICOTT—It is largely a matter of taste. One is just about as costly as the other, but if you want a blackberry plantation to last for a number of years I would keep the cultivator out of it after the first year every time. I would not allow it in under any consideration. I would not allow the ground to be turned up at all. The other question is, pay attention to locality. There is a great deal in that, but localities are very largely a question of calling for certain conditions and one of them is good drainage. Wherever the drainage is good it does not matter much about the locality, if the drainage is good and the mulch properly applied. The locality does not amount to a great deal, only there are some hardier than others. The Snyder and Taylor are hardier than the Early Harvest, I suppose, but I have not found it so. I have found the Harvest good where the Snyder and Taylor would not go through. The Harvest as ordinarily grown has a hard core inside and seedy, but when you grow them an inch long and one-half inch through, very mellow, when you eat them just the same as the Snyder and Taylor, you do not find any fault with them, and when they grow forty-two crates such a year as this one was on one-eighth acre, I consider that tolerably productive, particularly when it is the eighth year they have been fruiting.

Senator Dunlap gave notice of the meeting of the National Apple Growers' Congress, to be held in St. Louis about the middle of next August, and invited all members interested to attend the meeting.

Mr. Reasoner presented the following resolution:

Resolved, That it is the sense of the members of this Association that the business interests of our country demand that the General Postoffice Department shall be authorized to provide for a parcel-package and savings bank system, whereby packages of convenient size and weight may be speedily delivered, and making provisions for safety deposits of small amounts in all parts of our country;

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Resolved, That our Secretary be instructed to forward a copy of this resolution to our Senators and Representatives in Congress, also to the Postmaster General. (Signed)

FRED C. HUBBARD.
E. A. RIEHL,
E. G. MENDENHALL.

On motion, the resolution was unanimously adopted.

THURSDAY—AFTERNOON SESSION.

REPORT OF DELEGATE TO WISCONSIN MEETING.

A. W. BRYANT, PRINCETON.

The three topics in which the most interest was manifested and around which most of the discussion centered, at the annual meeting of the Wisconsin State Horticultural Society, held at Madison, February 5, 6, and 7, 1907; are the developing or securing of hardy fruits, particularly apples; co-operative marketing of fruits, and forestry.

On the subject of "Breeding for Hardiness," Prof. N. E. Hansen of South Dakota, who has just returned from a trip to Siberia, and Mr. Charles G. Patten, an Iowa veteran in the developing of new fruits, addressed the meeting. Prof. Hansen's theory and contention is that the originating of new hardy varieties must be done by crossing and that one parent of the cross must be hardy; that with slow-growing fruits such as apples the gain in hardiness from the influence of environment and selection is very little with each generation, and by this method it would take a thousand years to secure from desirable varieties in a temperate climate a variety of merit that would stand the winters of the Northwest, or forty degrees below zero on bare ground, which is his test.

Mr. Patten takes exception to this theory and claims through the influence of environment, one may, by selection as to adaptability, develop varieties that are hardy.

In the discussion following, different opinions were expressed as to the hardiness of the same varieties in different localities,

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showing that hardiness is but a general term and relates to soil, atmospheric conditions and climatic changes, as well as ability to withstand extreme cold. The proper handling of the orchard during the warm and growing season, so as to induce perfect maturing of the wood before severe weather, is a point that cannot be too strongly emphasized.

One entire session of the meeting was given up to "Co-Operative Marketing of Fruit," and the growers, the express companies and the commission men were represented. Gentlemen from Wisconsin, Michigan and Missouri, identified with local associations, described the working of their organizations and their problems, advantages and successes. While methods differ, all expressed the opinion that local organizations, properly managed, mean better returns to the grower, more expeditious handling, and better fruit to better satisfied consumers. One gentleman told of the order and commission department of the express companies and showed it up in a very favorable light. Another gentleman made a plea for better relations between the grower and commission man, and made the suggestion, which is undoubtedly true, that all the fault does not lie with the commission man. Mr. J. B. Graves of Neosho, Mo., although convalescing from an attack of the "grip," gave in clear, epigrammatic language the best address I have ever heard on the subject of "Some Problems of Co-Operative Marketing."

Wisconsin's natural forestry interests are large, and in late years her people have realized the necessity of forests and the need of judicious management to perpetuate them The outgrowth of this sentiment was an act by the legislature of 1905, creating a forestry board of five members and a state forester and an assistant state forester. Also, at the same time setting aside certain areas as forestry preserves. These areas have been increased and now the total reserve exceeds 234,000 acres. Although this board has been in existence but a short time, much good has resulted from its work, and the report of the forester for 1906, from which these facts were taken, shows a broad field for work and gives a promise of great good to be accomplished.

A very interesting paper was presented by Prof. Fletcher of the Michigan Agricultural College on the "Cost of Production." He enumerated and explained the many factors entering into the cost of growing fruit, and gave these figures which pertain to the whole United States: The average size of fruit farms is seventy-four acres; the average value is $70 per acre; the average value of tools on each farm is $175, and the average value of buildings and stock

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is twenty-seven per cent of the total investment. The most expensive item in the cost of production in all localities is human labor. The cost of producing fruit as computed from reports from leading growers is as follows·

Apples, 20c to 30c per bushel.

Pears, 24c to 60c per bushel.

Plums, 50c per bushel.

Peaches, 30c to 45c per bushel.

Grapes, four- fifths of a cent to 2c per pound.

Strawberries, 64c to $1.73 per bushel.

By a vote of the Society, an apple that has been known as the Sauk Co. apple was given the name of Hanko, after its introducer, and adopted as a variety. The original tree is forty years old, and if present reports hold, it is certainly a remarkable apple, The quality is called the best, size good, color a desirable red, streaked, and keeping quality very good. The tree is said to be perfectly hardy.

A very pleasant feature was th- banquet held the last evening of the meeting. It seems to me that this is a feature that would commend itself to our Illinois members in connection with the annual meeting.

The Wisconsin meeting was a success as evidenced by the good attendance and the interest and enthusiasm of the members both old and young.

REPORT OF DELEGATE TO POMOLOGICAL MEETING.

J. L. HARTWELL, DIXON.

The biennial gathering of the members of the American Pomological Society marks an important event in the history of American pomology.

The fruit grower who finds no inspiration in meeting such men as Col. Brackett of Washington, Professors Bailey, Webber and Craig of Cornell, and Sterns of Georgia, C. G. Patten of Iowa, or Mr. McNeill of Canada, has certainly missed his calling.

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Your delegate was present at all the sessions of this, the thirty-ninth convention of the society held at Norfolk, Va., September 24-26, 1907. The exercises were held in the Virginia State building of the Jamestown Exposition under a canopy of green bows with the odor of tropical flowers and fruits pervading the atmosphere.

The American Pomological Society and the Society of American Horticultural Science met co-jointly and were presided over respectively by Presidents Goodman of Kansas City and Brackett of Washington, D. C.

Without positive data, I would say there were one hundred in attendance, representing most of the states, Canada, Cuba and Porto Rico.

The apple exhibit was small and as a rule of inferior quality. C. G. Patten, of Charles City, Iowa, had an interesting exhibit of new varieties which will be referred to later in this report. A display of apples from San Diego, California, had a very suspicious hold-over appearance, being very fine in size, and color and quite free from defects, but I guess it was a 1907 product. Mr. Munson, of Michigan, made an attractive exhibit of his new grape, "King." The bunches and individual grapes were considerably larger than the Concord and of good quality. They were picked before they were ripe and a little disposed to fall from stem, which he claimed was not true under normal conditions. I fruited this variety in my station this year for the first time and think it may be of value for the growers of this State.

I was much interested in a display of figs grown near the coast in Virginia. Many varieties were shown, some of which were very large. The Scuppernong grape was much in evidence. It is a large, tough skinned, quite sweet grape, growing wild in abundance along the coast of Virginia and North Carolina. Those in attendance at this convention were shown through a large wine plant at Norfolk, where many tons of these grapes are converted into wine of excellent quality. They are shipped in barrels, for which the grower or gatherer receives an average of $20.00 per ton.

The first paper after the preliminaries of reports, welcome addresses, responses, etc., was taken from the program of the Society of Horticultural Science and was written by Prof. L. H. Bailey on "Horticultural Experiments and Research," and read by the secretary of that society. The author made a sharp distinction be-

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tween experimentation and research in horticulture—a paper of intense interest to a scientist and was written for an audience of scientists, as were most of the other papers taken from this program.

Prof. Webber, of Cornell, discussed "The Present Status of Citrous Breeding." This paper and that of Prof. Sterns, of Georgia, on Figs covered a new field to your delegate and were very interestingly presented. It appears from these discussions that the south, as well as the north, is profiting by the application of science to agricultural and horticultural pursuits.

Apparently the most vital problem for the Atlantic and gulf states is the securing of hardy varieties. Dr. Webber has done much work in crossing the extremely hardy varieties, some of which will endure climate of as high latitude as Long Island, but which are of poor quality, with tender varieties of good quality, hoping with some prospects of success to secure varieties with hardiness and good quality combined.

Dr. Webber narrated an experience which he had in connection with an orange tree, which had been injured by freezing. Different sprouts which came from the same tree produced oranges, lemons and pomelos or grape fruit. The frost's action on the cell structure of the tree seemed to produce a "reversion to type" and seemed to show a common origin of these quite broadly different fruits. A fairly complete sketch of fig growing in the southern states was given by Prof. Sterns. Here also the question of varieties seems to be as prominent as is that topic in connection with fruits which are discussed in this convention. Fig growing in the Atlantic and gulf states is limited by atmospheric conditions. They cannot be dried out of doors.

Prof. Lewis gave an interesting account of apple growing in Hood River Valley, Oregon. From his report it appears that the fruit grown there reaches the highest standard of perfection and brings correspondingly high prices, selling as high as $9.70 per barrel. Spraying and thinning are conducted with extreme thoroughness. The district is thoroughly organized. The grower is not permitted to pack his own fruit.

A paper on "Plant Breeding" by our Prof. Crandall ranks among the best of this interesting program. He gave an elaborate outline of the work to be done, showing its nature, possibilities and limitations. I quote this sentence "The establishment of a

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new principle or discovery of a new law is infinitely more valuable than the development of a new variety or discovering of a new strain."

W. M. Scott, Bureau of Plant Industry, Washington, D. C., gave results of treatment for "brown rot" on peaches in Missouri. Bordeaux mixture and sulphuric acid, all degrees of dilution, injured foliage. Self-cooked lime sulphur compound, 5-10-50 gallon formula, reduced damage to 10 per cent. Unsprayed plots badly affected. Prof. Taft, of Michigan, said that two pounds blue stone to fifty gallons water, winter spraying, controlled rot. Two pounds copper sulphate, three pounds lime, to fifty gallons water before June controlled rot. No damage to foliage.

Fruits of Canada Origin by W. F. Macoun, Ottawa, Canada. It would appear from this paper that practically all the varieties of apples of much value in Canada are traceable to the Fameuse, itself probably originating in Canada. Of the Fameuse seedlings McIntosh Red leads the list in popularity. Nurserymen could not supply the demand for trees. St. Lawrence and Baxter were spoken of as being of much value, the latter coming into bearing late, but producing good and regular crops afterward. The Herbert was considered a good raspberry. Pearl and Red Jacket gooseberries originated in Canada.

President Goodman in his address gave interesting review of history of American Pomological Society. It had been in existence sixty years. Mr. Wilder being its first president, donated $10,000, the proceeds of which to be used in awarding prizes for worthy new fruits.

It was my privilege to attend the meetings of the American Pomological Society held in Buffalo in 1901. "The Canada Fruit Marks Act" had just been passed. It was quite fully discussed at that meeting and much interest was shown in the probable effect in the marketing and grading of fruit. The working of this act in subsequent years was presented at the Norfolk meeting by A. N. McNeill, of Ottawa. He said that the act was popular with growers, dealers and consumers and has resulted in increasing the prices to the producers.

A motion was adopted for the appointment of a committee of five to confer with the Department of Agriculture at Washington to the end that we may have national legislation similar to the Canada Fruit Marks Act, and that all horticultural organizations of the nation are requested to co-operate with this society in assisting to secure said legislation.

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Prof. Waite gave the results of an effort to control pear blight by pruning, which has recently appeared in California. The work was thoroughly and systematically prosecuted by authority and under direction of the state and is fairly successful.

The Chinese sand pear was spoken of as a desirable stock for grafting, being absolutely hardy and entirely free from blight.

C. G. Patten spoke on apple breeding for upper Mississippi valley. He commenced cross breeding sixteen years ago. Has made many crosses of such varieties as Grimes Golden, Jonathan, Wealthy, Wolf River, and Pynes Paceata. He believed it possible to develop a pomology adapted to this region. Had a number of varieties on exhibition, bred from these varieties, some of which showed characteristics of parents, others did not. Pollen should be taken from trees not overburdened with bloom and which were healthy and vigorous. Seasons of low temperature produce germs for laying the foundation for breeding varieties of long keeping qualities. He had on exhibition crosses of Grimes Golden, Soulard crab, Patten's Greening, Jonathan, Roman Stem, Wolf River, Ben Davis and selected seedlings, about sixty in all. Many showed marked characteristics of both known parents.

Much emphasis was placed on the importance of state and local organizations as agencies to success in marketing fruit. This was brought out by an elaborate report made by a committee, of which Prof. Beach, of Iowa, was chairman.

The last evening's session was largely devoted to historical sketches of fruit growing in some of the older states, such as Delaware and Maryland, and while interesting were not considered of sufficient importance by your delegate to make them a matter of record for this society.

The Secretary then read the following letter:

DES MOINES, IOWA, Nov. 27, 1907.

W. B. Lloyd, Secretary, Kinmundy, Ill.:

DEAR SIR—For many years the subject of inspection of fruit, especially that for export, has occupied the attention of fruit growers and pomologists in the United States. Such inspection is had by law in Canada with the result that their fruit brings in European markets a higher price than any grown in the States. They claim that a part at least of this added price is due to the fact that their fruit has been inspected and is as nearly as possible according to representations so that a purchaser may buy it confidently and without further examination.

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At the 1905 meeting of the American Pomological Society, held in Kansas City, a committee was appointed to consider the subject and to suggest grades into which fruit might be best sorted. This committee, headed by Prof. W. A. Taylor of the Department of Agriculture, Washington, reported at the 1907 meeting of the American Pomological Society at Jamestown, Virginia, suggesting the following grades:

"Fancy" or "Extra" grade shall consist of well grown specimens of one variety, of uniform and at least normal size, of high color for the variety, of normal shape, free from insect and fungous injuries, bruises or other defects, and properly packed.

"Choice" grade shall consist of well grown specimens of one variety, of not less than medium size, of good color for the variety, normal shape and not less than ninety per cent free from insect and fungous injuries, bruises or other defects and properly packed.

"Standard" grade shall consist of specimens of one variety and not less than eighty per cent free from insect, fungous or other injuries impairing the soundness of the fruit and properly packed.

The report of the committee was adopted and also the following resolution:

That a committee of five be appointed by the chair to confer with the United States Department of Agriculture with the object of securing the enactment of national regulation intended to secure for us the substantial benefits conferred upon the Canadians by the Fruit Marks Act.

The following are the committee of five on grading and inspection: C. L. Watrous, Des Moines, Iowa; W. A. Taylor, Department of Agriculture, Washington, D. C.; W. C. Barry, Rochester, N. Y.; C. H. Williamson, Quincy, Ill.; and C. J. Monroe, South Haven, Mich.

In pursuance of such action these proposed grades are respectfully submitted to your Society in the hope and with the request that you will consider them seriously and advise the committee whether in your judgment the people represented by your Society would favor a federal inspection as proposed. The inspection would be voluntary, that is, any person proposing to export fruit might have it subjected to inspection and proper certification. Any one who preferred to ship his fruit without such action on the part of the government would not be hindered in any way. If such inspection and certification resulted in profit to those adopting

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it, it is difficult to see why they should be deprived of such advantage. It is also difficult to see why it would not be to the advantage of every other shipper. It is also confidently believed that the final result would be that we should have our fruit properly graded and get the highest price, the same as the Canadians now do. Whether the precise grades herein outlined shall be finally adopted is not now a matter of question because these things must be subject to regulations by Congress and the Department of Agriculture subject to amendment, but if you favor the general principle herein outlined we shall be glad to have your approval and assistance.

Hoping for a response as early as circumstances will permit, we remain, Very truly yours,

C. L. WATROUS,
Chairman of the Committee.

MR. HARTWELL—To bring this matter before the Society, I move that we endorse this action of the American Pomological Society. (Seconded by Mr. Perrine.)

MR. AUGUSTINE—I want to say this, that in the discussion of the subject at that meeting everybody seemed to be enthusiastically in favor of such a move and there was nothing to the contrary, and it was shown up in many instances where it is of great advantage to the shipper, because of the fact that wherever that inspection goes, that is an evidence that the fruit is all right clear through and there need be no question about it. There is no danger of the shipper having it come back on him for imperfect packing, and besides that, there is a penalty about it, as I understand it, for using the label or sending a report misrepresenting a lot. I am heartily in favor of our doing something in favor of it in our Society.

THE PRESIDENT—As I understand it, no one is compelled to be inspected unless he chooses, but the man that does so choose, can have his fruit inspected.

MR. HARTWELL—Really a privilege to the man that has good fruit.

MR. AUGUSTINE—It is not obligatory upon anybody to inspect.

MR. PERRINE—I would favor having it go a little further and make it compulsory; perhaps we are not ready for it yet. I think without doubt the law has been of great benefit to the apple growers of Canada; I think there that fact has been well established,

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and I believe it would be of great benefit to us to have a stringent law in the United States, but possibly we could not get such a law yet.

THE PRESIDENT—All that this committee, as I understand it, asks to have this Society do, is to have us say whether we are in sympathy with it or not, and that is all we are required to do, to express our sympathy; whether or not we favor inspection.

MR. GRAVES—In the work in which I am engaged we have not waited for the passage of a law of this kind, but we have in our own association obliged ourselves, our associates, to put their name on every crate of berries they ship. We have not waited for the law to tell us to do that, we want our fruit to go through right, and more than that, we have sent to the people to whom we have consigned our goods and have asked them to inspect the fruit in the markets and in the hands of the consumers and if they find any fault with our fruit, the name of the grower is on the crate, they know he has put up a bad job, they send us word back who is at fault and we correct that. Now, I believe that this law is the right thing, and I would encourage Illinois people and all other people to have a law of this kind. As growers we ought to protect ourselves and we can do it by this sort of law.

Motion of Mr. Hartwell was put to vote and carried.

REPORT OF COMMITTEE ON DR. BURRILL'S PAPER.

MR. PRESIDENT:—The committee appointed to consider the matter of forestry in connection with the paper presented yesterday by Dr. Burrill beg leave to report as follows:

The proper preservation and economic utilization of the forests of our country and increase in knowledge and practice concerning tree plantations have recently come to be considered of vast significance and importance, for our present and future welfare as individuals and as a nation. The problems appeal directly to the nation and to the state. The former is now actively engaged in its own part of the work; most of the states have at least made a promising start and rapid advance is assured. Illinois has larger interests at stake in this matter than is generally supposed, but so far no direct effective action toward meeting them has been taken. The time has certainly arrived when earnest appeal should be made to the people and to their representatives in the General

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Assembly in order that definite knowledge may be obtained concerning our actual forest conditions, our present and future needs and the best methods of meeting them.

For these purposes your committee recommend:

1. That this Society emphatically declare itself in favor of vigorous action to secure adequate forestry investigation and instruction in our State.

2. That we learn with great satisfaction that the director of the State Laboratory of Natural History feels authorized and is ready to undertake some initiative work in a forest survey and cordially approve his proposal in this respect, and hope the work may be speedily begun.

3. That we indorse the invitation made through joint resolution by our State Legislature to the Forest Service of the United States to aid in this work and add our earnest request for such co-operation during the ensuing year.

4. That a committee of three be appointed with power to act in promoting in every feasible way general interest in the subject and in securing co-operation on the part of other people and organizations in a movement to procure needful action at the next session of the State Legislature.

(Signed by the committee.)

H. AUGUSTINE,
R. O. GRAHAM,
JONATHAN PERRIAM,

December 12, 1907.

Prof. Graham moved the adoption of the resolution and that the chair be instructed to appoint the committee of three recommended in the report, which motion carried.

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REPORT OF DELEGATE TO HORTICULTURAL MEETINGS HELD AT JAMESTOWN, VA., SEPT. 23-30, 1907.

H. AUGUSTINE, NORMAL.

Leaving home September 20th, I arrived in St. Louis the morning of the 21st. Here I joined the western delegation headed by L. A. Goodman, president of the American Pomological Society.

Prof. Irish and Prof. Ducher joined the party here, and the delegation was assigned to a Pullman sleeper that was to take us through to Jamestown. Having a car set aside for the use of our party and the party containing so many enthusiastic and capable men interested in the same work, promised a very enjoyable trip, which promise was more than fulfilled.

We left St. Louis at 11:30 a. m. on the Chesapeake & Ohio R. R., and at 6:30 p. m. arrived in Cincinnati. There we were reinforced by a number of delegates from the northwestern states and Chicago, among them being J. C. Vaughan, of Chicago, Wesley Green, of Des Moines, and L. R. Taft, of Michigan.

Sunday morning when we awoke we were in the mountains of Virginia, and had to turn our watches ahead an hour to keep up with the procession. Soon we were in the beautiful and historic valley of the Shenandoah.

From Richmond to Jamestown we traveled through great stretches of country grown up in small timber; this was quite a puzzle to all of us until it was explained by a gentleman from Richmond, who had joined our party. The land had once been plantations and now abandoned on account of being so poor; even now the ridges of the old cotton rows could be seen between the trees.

Our headquarters were at a very pleasant hotel, having salt water within ten rods of the door on three sides, and we enjoyed eating oysters as they were brought up fresh on the wharf.

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Our first impression upon entering the Exhibition grounds was a very poor one, so far as the ornamentation of the grounds was concerned. The adornment of the grounds did not compare with the standards set by our past expositions. So far as display was concerned the exposition was generally considered a failure, though the historical and government displays were very fine. Needless to say that financially the exposition was a heavy loss.

The Pomological Society and the Society of Horticultural Science held their meeting together, giving first a number from one program and then one from the other. This made it necessary to omit a good many of the papers that were prepared, but these will appear in their reports when printed.

Many of the subjects were of no special interest to us on account of dealing with subjects having no connection with horticulture in our section of the country. I will only mention a few of those that were of importance to us.

"Notes on New Fruits," a paper by Col. G. B. Brackett, pomologist at Washington, was very ably handled and interesting on account of Col. Brackett's experience and extended knowledge along this line. He stated that notwithstanding the great amount of work done along this line, we are just in the infancy of the development of new fruits; a great deal has been done and a great deal more can be done by cross polinization. The Colonel is much interested in this work and through his efforts the Department at Washington is doing a great deal which will result in great good for the future of horticulture.

"Fruits of Canadian Origin" was the title of a paper by W. T. Macoun of Ottawa, Canada. It was a surprise to many of us to learn how advanced our Northern neighbors are along all horticultural lines, and their work on improvements of fruit is something they may well be proud of.

"Deductions from Experience in Breeding Orchard Fruits for the Upper Mississippi Valley," a paper by C. G. Patten, of Charles City, Iowa, was full of good things. This was one of the most profitable and interesting topics taken up at the meeting and I believe was so considered by the whole society. To the Illinois apple grower this paper alone was well worth the price of membership in the Pomological Society. Mr. Patten had on exhibition sixty varieties of worthy seedlings, and those planting in northern latitudes would do well to correspond with Mr. Patten.

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"Operation of Canadian Fruit Marks Act," a paper by A. N. McNeill, of the Fruit Division, Department of Agriculture, Ottawa, Canada, was full of interest, and I believe we could well copy from this law which compels all fruits stamped with certain brands to come to the requirements of those brands under heavy penalties. They report that this law is working great benefit to them and especially so in their export trade. It was recommended and seemed to meet with hearty approval from both Societies that all of the State Horticultural Societies join with Canada and if possible secure uniform legislation on grading and marking of fruits over the whole country. It seemed that grading according to size did not meet with the approval of most parties, on account of size varying so much in different parts of the country. Canada was well represented at the convention and their assistance and good feeling was much appreciated by all.

I felt very proud of our own Prof. Crandall of the Illinois University; his paper on the Plan and Side Issues of Horticultural Science was exceedingly interesting and well received, and I would suggest that if possible we incorporate this paper in our own volume this year.

Prof. L. R. Taft gave an able paper on Breeding the Peach to Overcome Disease. Needless to say this paper was good and to the point, as all of Mr. Taft's articles are.

F. W. Rane, Boston, Mass., gave a very excellent paper on the Forestry Question, bringing out very clearly the great need and benefit of government action along this line.

Your delegate was much interested in the large fruit exhibit at the convention, and had exceptional opportunity of enjoying it on account of being selected one of the judges of awards. The display was very fine, especially for this year, and consisted of a great number of varieties from all sections of the country, from Maine to California, and from Florida to Canada. Among the notable collections was that of Ellwanger and Barry of New York, consisting of ninety-six varieties of apples, 111 varieties of pears, and thirty-two varieties of grapes. C. G. Patten's exhibit of seedling apples previously mentioned was of special interest. The California exhibit was very complete and handsome, the fruit showing wonderful color and perfection. A plum exhibited by Prof. N. E. Hanson of Brookings Experiment Station, South Dakota, a cross of American blood with Prunus Simonii bearing at three years of age gave great promise for the Northwest. Also the King

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grape originated by Wm. K. Munson of Grand Rapids, Mich., created a great deal of attention, on account of its great size and hardiness.

This year was a very poor one for grapes and taking into consideration the condition of standard varieties like the Concord and also the statements of such men as Mr. Taft regarding the behavior of the King, it promises to be of great value.

REPORT OF DELEGATE TO THE MEETING OF NEW YORK STATE FRUIT GROWERS ASSOCIATION.

WILLIAM S. PERRINE, CENTRALIA.

Your delegate arrived in Western, N. Y., one day in advance of the meeting. In company with Mr. Clark Allis of Medina, we visited a few of the best orchards in Western, N. Y. We were impressed with the uniformly fine condition of the orchards, showing, as a rule, good cultivation and careful general treatment.

Although cultivated for generations, the soil is still strong, capable of producing large crops. Fall wheat looks as well as or better than any we ever saw. We were told that it would probably yield from twenty-five to forty bushels per acre.

It is not surprising that with such soil, coupled with good care, the orchards last for many years and produce almost annual crops.

We visited at Brockport the famous orchard of Foster Udell. Here we found the largest and finest trees seen anywhere. This orchard of less than sixty acres bears almost annual crops of 5,000 to 10,000 barrels of apples, quite a number of the trees having borne between twenty and thirty barrels per tree.

The meeting held at Penn Yan was one of the largest and most interesting in the history of the Association, as we were told. The opera house, holding six or seven hundred, was full at every session. It was one of the best meetings we ever attended.

We found in talking to the growers that they are almost all reducing the strength of the Bordeaux mixture from four to three pounds of copper sulphate in fifty gallons of water, and in some cases less.

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We also found that the growers nearly all use white arsenic in preference to Paris green or any other poison. Many are using potash (concentrated lye) to dissolve the arsenic. One pound potash to one pound arsenic in small quantity of water—one to two quarts.

Prof. Hedrick of the Geneva Station reported an experiment running for twelve years in fertilizing an apple orchard with wood ashes, using forty pounds per tree per year. The ashes had been applied at a financial loss. Report showed a slight gain in yield, no increase in color or keeping quality, but did hasten the ripening of the fruit on the tree. Experiments with other fertilizers so far had given little or no results. However, he advised growers to try on their own soil various combinations of fertilizers, to try to find out what their soil and trees needed.

One leading grower advised stopping cultivation earlier than had been the practice and seed to cover crops earlier—seed down as early as the tenth to fifteenth of June. He advised this that better color might be obtained.

The large and fine fruit exhibit, mostly by the experiment Station and co-operative experiments with growers brought out very forcibly the contrast in colors of apples grown under the sod mulch method and under cultivation. In every case apples from the sod mulch plots showed a much higher color and handsomer appearance than those grown under cultivation and cover crops. While in every case individual apples and the yield from cultivated plots was larger and in one instance the yield was more than double that of the sod mulch plot. Without doubt the best results can be obtained by the average grower from a modification of either method or a combination of both.

The San Jose scale was the most absorbing subject before the convention. One whole session and more was devoted to its consideration. All of the experts agreed that the lime sulphur wash was the best spray to use, and that, if done very thoroughly and taken in time, the scale could be controlled. After it was once established, there was little hope of complete eradication. It seemed to be the general belief that when large old trees became thoroughly incrusted with the scale, it was doubtful if it would pay to try to save them. We were impressed with the importance of growers keeping a close watch for the scale, and of beginning to spray at its very first appearance.

Prof. Slingerland said that not over fifty per cent. of the apple trees of New York were sprayed, and probably not one-half

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of these were effectually sprayed. Several growers advocated the use of coal tar on young trees to keep out borers. No bad effects had been seen. Prof. Slingerland also advocated its use.

Some of the leading growers of Western, N. Y., are seeding their orchards to Alfalfa which is mowed and left on the ground, or placed under the trees. In the spring the orchard and alfalfa are lightly cultivated with the disc, run at a slight angle.

Perhaps the most interesting and most valuable feature of the convention was the very large exhibit made by the Experiment Station of apples of two to four varieties, sprayed with varying strength of Bordeaux from a few ounces to four pounds sulphate. The condition and appearance of the fruit fully justified and verified Prof. Hedrick's report which he summarized as follows:

1. Under certain conditions russet injury will result from Bordeaux of any strength from one pound up.

2. Injury is the worst in wet weather.

3 A weak solution put on in large quantities and frequently may cause as much injury as a strong one applied in moderate quantity and at the usual intervals.

4. Excess of lime does not prevent or materially lessen injury.

5. In dry weather, excess of lime lessens the fungicidal effect.

6. Probably a weaker solution of Bordeaux will control scale and the Geneva Experiment Station will recommend three pounds sulphate the coming season.

Among the various power sprayers on exhibition the Friend seemed to be the best all round outfit. This outfit is made at Gasport, N. Y., by the Friend Manufacturing Co. Their last nozzle is probably one of the best things on the market.

The New York Association is composed of a very wide-awake and intelligent set of men, and we advise our society to keep in touch with them.

The President announced the following committee on Forestry: Dr. T. J. Burrill, O. C. Simonds and T. E. Goodrich.

The President presented to the Association the visiting delegates, J. B. Graves, Neosho, Missouri; F. J. Spencer, Ran-

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dolph, Iowa; Benton Gebhardt, Hart, Michigan, and L. H. Palmer, Baraboo, Wisconsin. Mr. Spencer, who had just come into the meeting, was asked to address the convention.

MR. SPENCER—We have in our State four auxiliary societies one in each corner, Northwest, Southwest, Northeast and Southeast. I belong to the Southwestern Iowa Horticultural Society—that is the best Society in the United States. It does embrace the best part of Iowa, I am speaking with all deference to the Northern parts, they are doing well, but for a winter apple district it is the principal one in the State. We had our meeting there last week, a very successful meeting indeed, the best meeting we have ever held, notwithstanding the small crop we had. We had at Des Moines a very good attendance and a very fine meeting indeed, as far as they had gone when I left. We have your delegate there with us and I think they will take good care of him.

On motion of Secretary Lloyd, the delegates from the four neighboring States were made honorary members of the Society.

Report of Auditing Committee was read as follows:

We, the committee appointed to examine the Treasurer's report, have examined the same and found it to be correct.

E. R. JINNETTE,
W. R. SOVERHILL,
H. M. DUNLAP,
Committee.

RESULTS OF SPRAYING EXPERIMENTS IN THE SEASON OF 1907.

W. S. PERRINE, CENTRALIA.

For several years our spraying has been somewhat of an experiment. That is to say, we used ever varying strengths of Bordeaux mixture, as well as different combinations of Bordeaux and poisons. During each season we tried to watch very closely the results or effects, of the different mixtures, and to vary next year's spraying accordingly. The formulas we used the present season were used because the results of the previous years seemed to us to justify their use.

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Experiments as follows:

First—In a Ben Davis orchard, several small blocks consisting of two middles each were sprayed with 4-4 Bordeaux and poison.

Second—Middles alternate with these were sprayed with poison alone. This poison consisted of two ounces of Paris green and 12½—5 formula of home-made Arsenate of Lead.

The poison was the same in both these experiments, and in facts the same in all of our spraying. The above were sprayed once before the bloom and twice after.

Third—The rest of the orchard, and in fact all of the orchards at the home place, were sprayed with one pound Bordeaux and poison, once before and once after bloom, third spray with poison alone.

Fourth—Our East Forty, or York orchard, was sprayed twice after bloom with one pound Bordeaux and twice later with poison alone.

Fifth—Sixty acres of apples that we bought were sprayed three and part of them four times with poison alone, after the bloom.

As to results:

The four pound Bordeaux blocks, quite early in the season, began to show considerable Bordeaux injury, and the injury increased as the season advanced. By the first of June the trees had hardly half their normal foliage.

The poison middles alongside were quite a contrast. The foliage looked good, and it was good. The individual leaves averaged much larger and many more of them. There were not many apples, but perceptibly more than on the Bordeaux middles. After about the first of September, the contrast in foliage gradually lessened. But even on November first there were a few leaves left and slightly in favor of the poison middles.

The one pound Bordeaux blocks showed a good deal of Bordeaux injury, but not nearly so much as the four pound Bordeaux. And the injury was hardly perceptible later in the season. As compared with the poison blocks, the foliage was not quite so luxuriant,—as a rule the leaves were plainly smaller.

The Ben Davis in the York orchard seemed to suffer more Bordeaux injury than anywhere else. Both the foliage and the

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set of apples showed it. Two weeks after the bloom it looked as though we would have a nice crop of Ben Davis on this orchard. About this time the apples began dropping and they kept it up until they nearly all dropped off. It may be suggested that the frost was the cause of these apples dropping. For years, not every year, but nearly so, we have noticed that our set of apples was not as good as in unsprayed orchards, and have often wondered if the spray could be the reason, but we were so rooted and grounded in the faith we put aside such thoughts as out of the range of possibility. But now I am sure that for years we have injured the set of our apples, especially that of the Ben Davis. This injury has varied from almost nothing to a great deal, such as we experienced this year. The Yorks in this orchard did not seem to be injured in the least, and produced a full crop of apples, remarkably free from scab and codling moth. Close to 98 per cent of the apples went into the barrel, and under the supervision of the buyer.

Now as to the last experiment,—sixty acres sprayed with poison alone. This orchard was purchased, and the spraying commenced fully ten days after the bloom, and after all of the three early sprays had been completed on our own orchards. Taking hold of this orchard so late in the season, we realized that very prompt and very thorough work would have to be done, if we were to win out on the deal. We had already noted considerable injury wherever the Bordeaux had been used, therefore we decided to try the experiment for the second time of spraying a whole orchard after the bloom with poison alone. The results proved the wisdom of the experiment. The orchard was sprayed once over and then the second time as soon as possible. The third spray was given about the first of August, and part of the Jonathan were sprayed the fourth time as soon as the third was completed. The heavy sprays, although two were given in close succession, caused practically no injury.

At picking time the Ben Davis showed some scab and other imperfections, but we had a nice little crop of fair quality. The Jonathans were of the highest grade and with the finest color and finish of any apples we have ever grown. The best part of the block sprayed four times, graded fifteen barrels No. ones to one barrel of No. twos.

Conclusions: First—The year 1907 was probably the worst ever known for Bordeaux injury, and we will probably not see another as bad for many years to come.

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Second—Strong Bordeaux, such as 4-4 or 4-6 Bordeaux, will cause much greater injury than a one pound, the injury varying about in proportion to the strength, where the quantity applied is the same.

Third—A heavy application of weak Bordeaux is more likely to cause more injury than a light application of strong Bordeaux.

Fourth—In seasons following severe and continued spring frosts Bordeaux is more apt to cause injury. This season it caused injury, even when applied during fine weather.

Fifth—Whenever the foliage is injured, the set of fruit is probably injured to a similar extent, though not so apparent.

Sixth—Of the varieties we are familiar with, the Ben Davis is about the most susceptible to Bordeaux injury, and at the same time it needs the Bordeaux spray much more than such varieties as Jonathan and Grimes. Bluestone should be used very sparingly, if at all, after the bloom, on these latter varieties.

Seventh—The less blue stone we can use and hold the scab and other fungi, in subjection, the better. Our fruit will be of a higher color and finish, and will command a higher price on the market.

Eighth—Each season brings new and varying conditions, and the grower should be on the alert and vary his spray calendar to suit these conditions in order to achieve the highest success.

Ninth—I do not advocate discarding the Bordeaux, but simply to use it in moderation and advisedly.

DISCUSSION ON MR. PERRINE'S PAPER.

MR. STANTON—In giving the formula, do I understand that you used simply the Bordeaux, or poison combined with the Bordeaux in the first place?

MR. PERRINE—In this case, it was combined with the Bordeaux, it was a combined mixture.

MR. STANTON—It might be taken otherwise. You speak of the Bordeaux mixture and we all understand by that, that it is not the combined mixture.

MR. PERRINE—Yes, I think I said there, that this contains the Bordeaux and the poison.

MR. VORIS—Just before the bloom?

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MR. PERRINE—Just before the bloom, and after the bloom we used it somewhat in some of our orchards.

MR. MORRISON—What do you mean by the Bordeaux mixture?

MR. PERRINE—The Bordeaux mixture is the sulphate of copper and lime brought together. The quantity varies. If you want the standard formula, it is four pounds of bluestone and four pounds of lime.

MR. MORRISON—You get something else in your spraying?

MR. PERRINE—When we use one pound of bluestone to one pound of lime or two pounds of lime to fifty gallons of water we have a solution of a weaker strength.

PROF. GRAHAM—We had this experience, we sprayed quite heavily, really through a misunderstanding of the foreman, unusually heavily. Our Ben Davis orchard had perhaps a half crop and the leaves we found were injured decidedly this season. I attributed the losing of the heavy set of fruit that we had at first to the spraying with Bordeaux and thought that if we had not sprayed we probably would have saved a large portion of our fruit. But a Ben Davis orchard directly adjoining ours that was not sprayed at all, did not have any fruit at all, while ours had several hundred bushels, so I concluded that it was not entirely due, that is, perhaps we have not lost much fruit through the spraying, while we had decided injury to the leaves.

MR. PERRINE—We had that forced upon us this year—that we did actually kill the set of apples with the Bordeaux mixture; in this plat where we sprayed with four pounds, and then alongside with no bluestone, we had it demonstrated there and then in the sixty acres that we did not use any Bordeaux on at all, we had a nice little crop of Ben Davis. Some trees next to the Jonathan were full enough.

MR. STANTON—At which stage of the spraying do you think you did the killing?

MR. PERRINE—After the bloom mostly; although in this east forty we went out and sprayed one day before the freeze came and the freeze struck us and then we had to quit until after the bloom, and when we went out there after the bloom, we left our spray outfits right there, quit that night, and we took them up when we went back and those trees showed that they had been hurt, it was very perceptible, the general cast of the orchard would

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indicate that they had been literally salivated with the spray, they went out of bloom days before the rest of the orchard. Now, that was before the bloom, there was some bloom out. We never have had such conditions as we had this year and I do not believe we will have as much spray injury again on our apples. Wherever we touched the orchard with the bluestone we had injury, more or less, according to the strength and the amount applied.

PROF. GRAHAM—Do you suppose the stamens and pistils were injured?

MR. PERRINE—Yes.

MR. GOODRICH—We do not quite catch your formula, will you please give it to us now, the number of ounces that you made this year where you got the bad results, give us the number of ounces please, that you used to 100 gallons of water, how many ounces of bluestone?

MR. PERRINE—Bluestone we used one pound, good and strong, to fifty gallons.

MR. GOODRICH—How, how many ounces of poison to the 100 gallons?

MR. PERRINE—We used the home-made arsenate of lead which is made of twelve and one-half ounces acetate of lead to five ounces arsenate of soda, that is the formula we followed. That is, of course, the resulting acetate of lead is about a half pound or less. One half pound to the fifty gallons.

MR. HARTWELL—It was recommended to me about two or three pounds.

MR. PERRINE—That is the paste lead that is on the market, that is a different thing, you have a great lot of water in there.

MR. HARTWELL—I did not notice your making the statement, but I have heard stated as coming from you that you charged the result of your good crop of apples to the effect in the matter of the modification of the frost from the presence of this arsenate of lead on the foliage and on the tree. I do not know where I got that, but that came to me, the fact that Mr. Perrine had an unusually good crop of apples this year was due to that?

MR. PERRINE—I do not think it modified the effect of the frost at all, we simply saved what apples we had where we did not hurt them with the Bordeaux mixture.

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MR. STANTON—Is it not possible that the unusual weather of this previous period had something to do with this injury, as well as the spray?

MR. PERRINE—Undoubtedly.

MR. STANTON—In the light of former experience, is it not true that most of the injuries came from frost; having used these same formulæ from year to year without injury?

MR. PERRINE—We have not used them without injury at our place. We have thought sometimes we were less skillful in making Bordeaux mixture, but we have tried to inform ourselves and make it in the very best way we could and still we would get more or less injury. Now, I think that was partly due to this, that we have been spraying very thoroughly, very heavily, that is, we put on a thorough, heavy application and especially after the bloom. Well, now, the larger the quantity applied, the more apt you are to have spray injury, or Bordeaux injury, if the weather is the least bit bad. If the weather is fine, we do not get any injury, but if it is bad, we do get some injury, more or less, according to the conditions.

A MEMBER—What do you mean by bad weather, cold weather or damp weather, which would you call bad weather, or would both be bad?

MR. PERRINE—I think the very worst condition is heavy frost, it seems to affect the foliage in such a way that it is very susceptible to spray injury and then continued wet weather or cloudy weather is bad for spray injury. That has been our experience.

PROF. GRAHAM—Do you use the arsenate of soda, or the arsenite?

MR. PERRINE—Arsenate, making the arsenate of lead. Some of you remember that I was called upon to make some remarks along this line at the Apple Growers' Congress and I was called to account by a gentleman there that professed to be a chemist, I guess he was. He said that our homemade lead, if it did not have the lime in it, would cause injury, and if we did put lime in, it was not arsenate of lead any longer. I told him we get the results just the same, and we did get remarkable results this year, and we got some very good results last year. Now, to satisfy myself I wrote to Prof. Taylor of the Department and some others about some of these points, asking if homemade arsenate of lead was likely, unwashed, to cause injury, and he referred it to two chiefs and they both wrote independently of each other and their replies

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were practically the same, they both said that they did not think that the homemade lead unwashed was likely to cause injury, and application of lime they did not think would lessen its value in any way, though it would stick practically as well and it would not change its form.

MR. DUNLAP—I was very much interested this summer in visiting Mr. Perrine's place and seeing the experiments and their effects upon the foliage and upon the fruit, but I am not altogether satisfied myself that these conclusions are exactly what we can abide by. I do not believe that they have gone far enough for us to say that we can do away with the Bordeaux to any considerable degree. There is one thing that illustrates that. Mr. Perrine will probably remember, I do not remember the locality, but there was undoubtedly spray injury, a very serious effect from the use of the Bordeaux and all these other things that he stated here are just as he stated them, but in an adjoining orchard that we passed, the foliage was exceedingly fine, as good foliage as there was upon his sprayed orchard where he had sprayed with the arsenate of lead, and in that orchard, as I remember it, there had been no spraying whatever. Now, I am not speaking about the fruit, I am speaking about the foliage of the tree, because as I remember it, this orchard had no fruit on it to speak of, but there is this thing that I have in mind, and that is that this year was not a scabby year in which the scab fungus cut any particular figure and when we could have sprayed this year with the arsenate of lead without any serious damage to our fruit and perhaps very much to our advantage, yet, ordinarily, can we do without the use of the Bordeaux? That is the thing that I am questioning myself at the present time and I have not decided that I can do away with the Bordeaux as yet without further experiment. This illustrates the need of further experiments along this line and under very careful direction of the Society or some of its members, and from year to year until this thing is thoroughly sifted. I believe myself that we are in the primary stages, we are simply reading the primer so far as the use of spray mixture is concerned, and the best combinations. We have not yet gone into the second reader at all and there are always other readers ahead of us that we have got to investigate and learn, and we will look back in years to come and we will think that we were very primitive indeed at this time. So I believe there is very much to be learned. Now, this year has demonstrated this one thing, and it has been demonstrated, I am sorry to say, several past years of this present century, that the fruit that is injured by heavy frost will sustain considerable injury by the Bordeaux that happens to be upon

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that fruit at the time, in other words, the fruit is put in such condition that the Bordeaux has a very active and perhaps a very injurious effect on the fruit that is affected by the frost, and there is no way that we can keep the frost off that I know of, but we must experiment along the line of least injury, and our spray mixture certainly will have a great deal to do with it. If I could believe what I saw at Mr. Perrine's, and accept that whole thing and spray with the arsenate of lead, I should be very much happier over the spray situation than I am, but for the present I believe we will have to stay by the Bordeaux mixture, although I believe that with the frost injury that we had, that the Bordeaux did a great deal of damage. At the setting time, after the fruit had set, I thought I had a good half or two-thirds crop of fruit in my orchard, but when the June drop came along, after that got through, I found a very small crop and on my home orchard at Savoy I had no crop at all, while my Willow Twigs had promised to have a crop previous to that drop. Now, what caused that drop, whether the frost or whether the use of the Bordeaux, I am not prepared to say; I wish I knew, and I think we ought to use, as Mr. Perrine suggests, the Bordeaux in perhaps a modified degree. I am of the opinion now that I shall use the Bordeaux in the proportion of about three pounds for the first spray and two pounds after that in this coming season's spraying, and as for using arsenate of lead or Paris green, I have not decided that.

MR. STANTON—How much lime?

MR. DUNLAP—For myself I will use enough to liberate the free acid, and I am not satisfied that you can use too much lime, so that it will be harmful in its application to the tree.

THE PRESIDENT—Your idea is that under the condition of the weather we received different effects from the use of the Bordeaux this year from what we usually do?

MR. DUNLAP—I certainly do.

PROF. BLAIR—I have listened with a great deal of interest to this paper and was glad to keep track of the reports that came from these experiments at Centralia during the summer. I think that sort of work is very valuable, and I think that we all can congratulate Mr. Perrine on the excellent showing that they made there. The more of this sort of experimental work that we can have the better, and I am glad to see it. I would like to ask one question, I am sure it is one that the growers are thinking about,—What will be our procedure next year, and I am just wondering if Mr. Perrine cannot tell us in a word or two just what he will do

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next year as the result of the experiment he has been accumulating during the past year. If he can tell us in two or three words what his procedure will be next year, we will be able to consider a little better just how the situation lies in his mind. We have the same thing that he has, we do not know what the weather condition will be; some of us will have to place orders for copper sulphate shortly and we are all wondering how much copper sulphate we will have to use.

MR. PERRINE—I think Senator Dunlap has hit the key to the situation, that we do not want to jump at conclusions, we do not want to go entirely by this year's experience. What was all right this year may not be the thing next year. We sprayed the one orchard without any bluestone; I do not believe the ordinary year that will do at all; I do not believe it will be wise at all to risk it. Prof. Blair asks me in a word or two to give what our plan is for next year. I think we can spray with the Bordeaux mixture before the bloom, using possibly as much as two pounds to fifty gallons before the bloom, but if the weather is a little bit bad, we will be very careful not to spray too near the bloom for fear of injury to the blossoms, always using an excess of lime. If we use two pounds of copper sulphate, we would use about three or four pounds of lime. After the bloom I do not believe we should use any blue stone in our tank, especially if the weather is a little bit bad. With the fungicidal effect of the first Bordeaux spray, coupled with the fungicidal effect we get in the lime and the arsenate of lead, I do not believe we need it, with very thorough spraying, I think we will stave off the scab, especially where we have been spraying with the Bordeaux mixture for years, the scab ought not to develop very badly and I do not believe it will. As I said in my conclusions, the less blue stone we can use and still keep the scab and other fungii in control, I believe the better. A little later on, after possibly the second spray after the bloom, I believe we will use some Bordeaux for the bitter rot and for the apple blotch. On our old orchard we have more or less apple blotch and we have to use some Bordeaux to counteract that.

MR. DUNLAP—You will not get any injurious effects from Bordeaux at that time of the year; I do not anticipate you will get any injury to your fruit the last of June or first of July.

MR. PERRINE—I do not believe so.

MR. DUNLAP—Well, then there is another question I wanted to ask. Don't you think that when you began spraying with that

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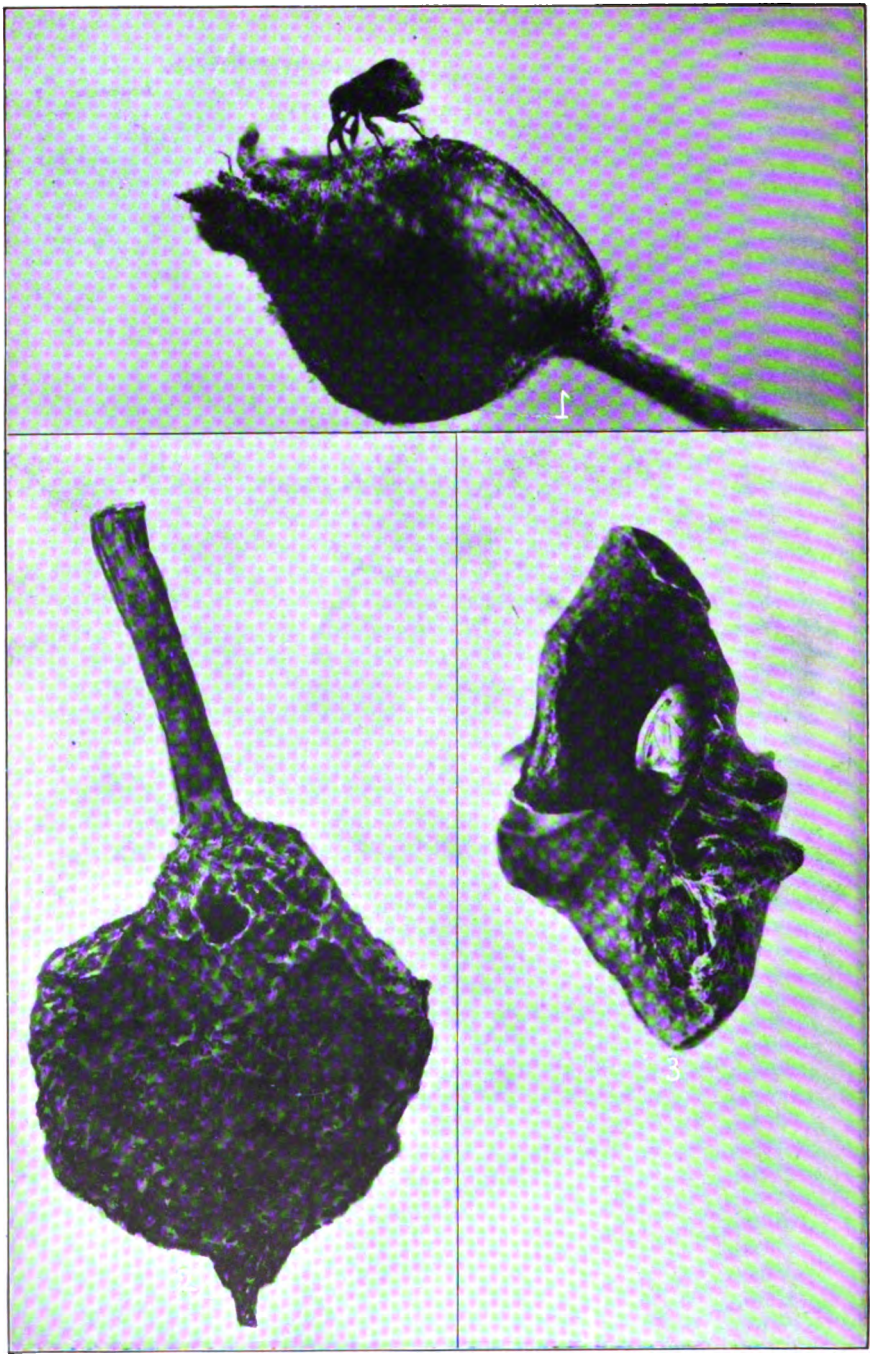

FIG. 1—APPLE CURCULIO MAKING EGG PUNCTURE.
FIG. 2—EXIT HOLE OF APPLE CURCULIO IN SMALL APPLE.
FIG. 3—APPLE CURCULIO PUPA IN APPLE.

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arsenate of lead on that orchard of Jonathan's that you bought, ten days after the bloom had fallen, the time had practically passed after which you would get any scab injury?

MR. PERRINE—Rust?

MR. DUNLAP—Or rust injury—well, not necessarily, the rust injury or scab injury, so that you really did not need a fungicide at that time? In other words, the first two sprayings are used as a fungicide, if used at all.

MR. PERRINE—Yes, for the apple scab, as a rule.

MR. BESLY—How many sprays will you make before the bloom?

MR. PERRINE—One; if we have time and the weather justifies it, we will make two. There is another thing I think I did not emphasize, and that is, when we use Bordeaux mixture we must not make the application too heavy. With our power sprayers we are just a little bit inclined to make the application too strong and if the weather is bad we will suffer for it. Now then, after the bloom, we ought to spray very heavily to get the effect upon the codling moth and the curculio, the spraying ought to be very thorough, the more you can get on the better for the codling moth and the curculio. This orchard that we commenced on ten days after the bloom, the curculio was making pretty heavy inroads there; we could see lots of the effects of curculio, but we went in and sprayed heavily and at picking time we saw very little curculio work.

MR. NEELEY—I want to ask one question. I am a little fellow at apples and I use a hand spray, have a pressure gauge, and I find it impossible to get much above ninety pounds regularly. We tried to get 100 pounds, but it is hard to get a man to hold it there, and I find I have never injured my trees with the Bordeaux mixture. I used the 4-4 formula. Is it possible that the pressure you get with the power sprayer is any more injurious than the power you get with the hand sprayer?

MR. PERRINE—Well, I never thought the pressure itself injured the foliage, and yet I believe on this block of Jonathans this year, the young block, we did get a little spray injury caused by the direct hitting of the apple. The trees were not very large.

MR. NEELEY—Another question. I wield the nozzle myself, never hire a man to do that. My business is small, your business is large, and you have to trust to your hired man. Is it not possible that they sometimes put on an excessive amount of it?

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MR. PERRINE—Yes, we spray, one man on the tower, one man on the ground, and the ground man usually gets on too much of the mixture and the tendency is for him to stand right there; to hit through here and around there, and he will get it here most all the time if you do not watch it. You will have to watch him and get him to hit the tree all around. There is the trouble.

COMMERCIAL STRAWBERRY GROWING, FROM THE STANDPOINT OF A NORTHERN ILLINOIS GROWER.

J. L. HARTWELL, DIXON.

Northern Illinois is not so different from other parts of the State as to call for any special discussion in the production of a crop of strawberries. A brief outline in that particular will suffice.

I assume that all thorough-going berry growers cover their fields in late fall or early winter with some kind of mulch, so that little or no harm comes from the slightly lower degree of temperature more than where freezing is less severe. In the twenty-five years which I have grown strawberries for the market, I am not aware that my plants have been materially injured by winter freezing. My impression is that we are less likely to suffer from late spring frosts than are the growers of a lower latitude.

The berry growers in the Central District who used to ship to our section in considerable quantities, have either found a market elsewhere or have dropped out of the race. There is nearly a week between our first picking and the last shipment from the growers south of us. This condition usually gives us fancy prices for our extra early varieties. There is little difference in the period of the Michigan crop and that of our own. An extra late variety such as the Gandy is quite popular with our growers as outside competition has practically disappeared at its time of ripening.

I prefer early planting, which with us extends from the middle to the last of April. Later planting is frequently made difficult by dry weather, and a poor stand is not an uncommon result. It is much easier to transplant a plant that is dormant than one that is well along in its growth. The removal of all old leaves will greatly diminish the possibility of insect and fungus infection.

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My favorite succession of crops is clover, potatoes and strawberries. I use much fresh stable manure applied to both the clover and potatoes and where possible the potato ground receives a dressing immediately after the crop is harvested which is plowed under usually in November. This puts the soil in excellent shape for early working in the spring.

There should be no clods in the field to be planted. My plants are set two by four feet with a transplanting trowel. This trowel is made of a flat piece of steel six inches wide and eight inches long with handle at right angles to blade. A large part of the cultivating is done with a weeder when season is not too wet up to time runners begin to take root. Later in the season this tool is sometimes run crosswise of matted rows as a thinning process.

At least three tons of straw to the acre is necessary for mulching. This is placed between the rows when growth is started in the spring and may be placed over the rows in the afternoon and removed the following morning at no great expense, as a protection from prospective late frosts.

I have harvested as many as four good crops from one planting but find it dangerous. The crop of pests increases with the age of a strawberry field. It is safer to stop with two and one if the leaf roller is troublesome.

Mowing and burning a field after harvesting as a preliminary for a second crop is an excellent practice where conditions are favorable. A slow fire with much litter is liable to kill many, if not all the plants, especially where the ground is dry. This year I ran a spring-tooth rake lengthwise of the rows leaving enough litter between the rows to make a quick fire which ran between the rows without crossing them and no damage to plants resulted. A fire is very discouraging to many strawberry pests.

The row is reduced to ten inches or a foot in width by a stirring plow, which is followed by a common farm drag running both ways leveling down the furrows and dragging more or less loose dirt over the plants.

The question of picking with us is largely a local one and must be solved by each grower for himself. We have no professional berry-pickers. We depend largely upon women and children for that kind of work. Much depends upon a kind hearted, good natured, firm field superintendent.

It is easy to see that the problems involved in marketing our fruit are very different from the growers of Southern Illinois who

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can fill a car or more with one day's picking, or where smaller growers who through fruit shipping associations do the same thing. Permit me, however, to call your attention to a fact which you already know, namely: The difference between the market conditions of the berry-growers of Southern Illinois and those of the Northern District is not so marked as it was a few years ago.

Not many years since the first berries that reached the Chicago market came from Southern Illinois. These frequently retailed at twenty-five, thirty and even forty cents per box.

Among other industrial revolutions which the south is undergoing it is rapidly waking up to its natural and legitimate place in fruit production and growers of all classes of fruit in Illinois must reckon with that fact from this on. Lately the man from Texas has picked up the early market plum. Oklahoma, Arkansas, Missouri, Tennessee and Kentucky supplement their more southern neighbors. Conditions for shipping north at times of harvest from the remote south are usually peculiarly favorable. For a number of years the first berries which reach our market and which, of course, travel the longest distance, are in much better condition than those which come from nearer home. This, of course, may be due to better methods of handling, but I have charged it to more favorable atmospheric conditions for shipment. It is very plain that the Southern Illinois grower must enter a market from this on whose edge has been very much dulled.

Most of the berries grown in Northern Illinois are marketed at home. Most of the cases are not even covered. Chicago never has been and until conditions change never can be a market for our berries. The best of water transportation, and a soil, and climate peculiarly adapted to the production of berries give Michigan a monopoly of the Chicago berry market at the time she is harvesting her crop. We cannot sell berries at Michigan prices and keep going. There are a number of reasons, as it seems to me, why Northern Illinois may have in the near future to a considerable extent a commercial berry growing district. In the thirty-two years that I have lived in Northern Illinois we have not had a single corn crop failure and while we have had a few short berry crops the yield I think will average as well or better than that of either Southern Illinois or Michigan. We had a good crop last year which was not true of either of these two berry districts. The supply of berries for cities south of us at the time of our harvest naturally comes from our district, for which I can testify from experience, often gives good returns.

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The very rapid growth of cities of the northwest such as Minneapolis, furnishes us the same kind of market that Chicago produces for the southern grower. With these outside possibilities for placing our crop, added to a strong local demand, commercial strawberry growing, it seems to me, may be considered as one of the profitable industries of Northern Illinois.

Discussion of Mr. Hartwell's Paper.

Mr. Perrine—I would like to ask Mr. Hartwell if he has never seen any injurious effects from running a weeder over a strawberry plantation? We tried that a few years and finally quit it; we thought it did injury to the strawberry plants. You know the new roots always form from the top. Well, now, a weeder comes along and it is set to slide around the strawberry plants and it does do it; at the same time it has a tendency to tear off those newly set rootlets.

Mr. Hartwell—I would say about the weeder, Mr. Perrine, that it has been overestimated in its value. The weeder is a tool that has its limits, emphatically so. I would not discard it, yet many years I never hitch to it, some years I use it a great deal. I use it in potatoes more particularly. I do not know of any better tool for cultivating potatoes than the weeder, up to the time of blossoming. In extreme wet seasons it is almost useless. As far as tearing up roots is concerned, it does that, but I do not think it does much more damage than the ordinary mower, and the cutting of a root sometimes is a profit instead of a harm, as all commercial growers prune their strawberry roots before planting them. Of course you do not prune by tearing out bodily from the stock, but cut them back, which is very much of a benefit, so that used with discretion I have found the weeder an excellent tool. I use the Planet Jr. tool usually for my cultivation, eleven-tooth cultivator and a five-tooth very little, not using the five-tooth unless the ground gets packed from moisture. I have a different soil from you; our soil is a thin clay soil with very little subsoil; not over six inches, it packs very easily, pulverizes very nicely under favorable conditions. Will hold a great deal of food, consequently for manuring I use a great deal of coarse manure. I take the manure that comes from the livery stable, put it on the soil, turn it under, then it warms up the soil.

Mr. Hubbard—Do you spray for the leaf roller?

Mr. Hartwell—I never have sprayed but little and I could not see that I was getting much benefit from it. I doubt if we reduce the crop enough to justify the operation. I am not certain,

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from the fact that when you are spraying there are more or less of the little fellows that have gone to bed and do not care whether you spray or not. I am not at liberty to catch on to my sprayer at any time the little fellows call for me. I honestly believe that you will control it if we take but one crop for a year or two.

MR. HUBBARD—Mine were covered with small eggs.

MR. GRAVES—If you had a field like his, what would you do with it? Recently planted and badly infected.

MR. HARTWELL—Well, I don't know but I would take the plow to it.

MR. GRAVES—That is the best thing to do.

MR. HARTWELL—I believe so. I got hit with that thing once and I don't want to be hit again, and if anybody has a theory regarding the cause of the disappearance of the leaf roller I wish he would present it. I never sprayed and they are absolutely gone from my place for the last six or eight or ten years. Nearly ten years ago I was nearly cleaned out with the leaf roller. While on the subject of pests, we have recently had appearing among us a pest that the corn growers have had to fight that I have not noticed very much until within the last two or three years, and that is the root louse. It acts queerly, I do not understand it. I know the nature of the root louse on the corn and this acts in the same way, only it does not seem to like some kinds of strawberry plants at all. I had a row of Warfield literally destroyed right between two Dunlap rows that were not touched. They were forty rods long, so that they stuck right to that row. I cannot see any remedy for them except moving them. I assume you people are familiar with it; I would like to have some testimony on that if you have any to give. It is new to us.

REPORT OF DELEGATE TO MISSOURI HORTICULTURAL MEETING.

J. M. JORDAN, SAVOY.

As the delegate from this Society to the second semi-annual meeting of the Missouri State Board of Horticulture, which takes up the work of the State Horticultural Society, whose means of

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support was cut off by the founding of this board, I would report the following: The meeting was held at Columbia, where it is permanently located, December 3, 4 and 5.

Columbia is a hustling city of some 8,000 people; the State University is located here with its numerous and well equipped buildings and has an enrollment of about 2,500 students; the horticultural and agricultural schools are well patronized; the town is also the possessor of a five mile limit law by legislative enactment.

The sessions of the Board, which were presided over by Pres. Ducher of Warrensburg, were held in the lecture room of the Horticultural building and were reasonably well attended, considering the off year for fruit, etc., the crop in the State being a complete failure. A very few plates of State grown fruit were exhibited; some Washington and Michigan fruit was shown and looked very well.

The program was filled up by about thirty-five practical papers on various phases of the craft. President Lincoln, of the Arkansas Society, was present and presented the "Proper Culture and Care for Orchards." Capt. Lincoln says he has discovered a third brood of the codling moth, but in this I think he is mistaken; possibly members of a late second. San Jose Scale, the codling moth and subsoiling were treated in papers and talks.

"The Education of the Farmer's Boy" and the teaching of Horticulture in the public schools took up one session and were handled in a very able manner by Prof. Hoover of Warrensburg and Miss Jackson of Kirksville, Mo., schools. "Pure Food Laws and the Farmer" was thoroughly discussed by Prof. R. M. Washburn, State Food and Dairy Commissioner. Mr. Washburn advised the rigid enforcement of all laws pertaining to food products. Vinegar and fruit products were especially touched upon and numerous means of adulteration disclosed. He advises the real thing and a good price for it.

"The Planting, Fertilizing, Growing and Marketing of Strawberries," was also taken up in as many papers. Spraying, by both methods in vogue, brought forth lively discussion, but disclosed nothing new in this line. The use of the lime sulphur mixture in experiments to find the best method of controlling brown rot of the peach, which is very bad in South Missouri, by Prof. Faurot of the Mountain Grove Station, brought out the fact that the 10-15-50 self-cooked combination, with five applications, beginning about April 22 in that latitude and repeated each ten days.

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gave the best results. Prof. Faurot's remarks on the use of liquid Bordeaux for the control of Bitter Rot of the apple were very much to the point and were well presented by the use of enlarged bromoids showing the fruit in the different plots.

The co-operative marketing association question was a very live subject and discussed quite freely; the idea of associations is quite right if all the members can be held in line when the proper time comes, but the running of such associations must be left to the manager—that is what he is paid for,—and any association to be a success must have the individual support of all its members.

Your delegate was treated very courteously by the members of the Board, and he extended the invitation to all who could do so to attend our meeting this week.

MR. BARRY—The Department of Botany, especially the pathological side of it, hopes to get each year a certain number of plant diseases occuring in this State. It is only by the help of the members of this organization and similar organizations that we can get such records. They are valuable for many reasons, and if you will assist us by sending us notice on the occurrence of any epidemic of any disease, or send in specimens to the Department of Botany whenever you see anything that seems to be wrong, it may be of great benefit to yourselves as well as to us. The United States Department calls on the station each year for a report on occurrences of various kinds of diseases on all fruits and vegetables. As you will see, it is a difficult matter for one man to collect all this data all over the State for all localities, but with your help in sending in reports, (we will furnish blanks if you so desire, it will not take very much time to fill those out and send them in to us), we can keep on record a history of the occurrence of these various diseases. I hope you will be able to help us out in this matter.

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PREMIUMS AWARDED.

The list of premiums awarded was read by the Secretary as follows:

CLASS I.

E. A. RIEHL, JUDGE.

Best collection of apples, not less than 6 and not to exceed 15 varieties, A. C. Mottaz, Hardin, first; C. M. Paisley, Hillsboro, second.

Best plate new apples, good enough to be recommended, George Winter, LaSalle, first; S. G. Soverhill, Tiskilwa, second.

CLASS II.

NORTHERN ILLINOIS.

L. F. DINTLEMANN, JUDGE.

Best 4 varieties winter apples for market, L. R. Bryant, Princeton, first; S. G. Soverhill, Tiskilwa, second.

Best 4 varieties winter apples for family use, L. R. Bryant, first; S. G. Soverhill, second.

Best 3 varieties fall apples for market, S. G. Soverhill, first.

Best 3 varieties fall apples for family use, S. G. Soverhill, first.

Best single variety winter apples for market, L. R. Bryant, first; S. G. Soverhill, second.

Best single variety winter apples for family use, L. R. Bryant, first; S. G. Soverhill, second.

Best single variety fall apples for market, S. G. Soverhill, first.

Best plate Ben Davis, S. G. Soverhill, first.

Best plate Willow Twig, L. R. Bryant, first; S. G. Soverhill, second.

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Best plate Jonathan, L. R. Bryant, first.

Best plate Grimes Golden, L. R. Bryant, first; S. G. Soverhill, second.

Best plate Salome, L. R. Bryant, first; S. G. Soverhill, second.

Best plate Snow, S. G. Soverhill, first.

Best plate variety not named in above list, L. R. Bryant, first; S. G. Soverhill, second.

Class III.

Central Illinois.

W. S. Soverhill, Judge.

Best single variety winter apples for market, Edward Lutener, Liberty, first and second.

Best single variety winter apples for family use, Edward Lutener, first and second.

Best plate Ben Davis, Edward Lutener, first.

Best plate Jonathan, Edward Lutener, first.

Best plate Grimes Golden, Edward Lutener, first.

Class IV.

Southern Illinois.

Edward Lutener, Judge.

Best 4 varieties winter apples for market, H. L. Bieble, Belleville, first; H. M. Simpson & Sons, Vincennes, Ind., second.

Best 4 varieties winter apples for family use, H. L. Bieble, first; H. M. Simpson & Sons, second.

Best 3 varieties fall apples for market, H. M. Simpson & Sons, first; A. C. Mottaz, Hardin, second.

Best 3 varieties fall apples for family use, A. C. Mottaz, first; H. M. Simpson & Sons, second.

Best single variety winter apples for market, H. L. Bieble, first; G. H. Perrine & Sons, Centralia, second.

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Best single variety winter apples for family use, H. L. Biebel, first and second.

Best single variety fall apples for market, G. H. Perrine & Sons, first; H. M. Simpson & Sons, second.

Best single variety fall apples for family use, G. H. Perrine & Sons, first; W. B. Lloyd, Kinmundy, second.

Best plate Ben Davis, H. L. Bieble, first; G. H. Perrine & Sons, second.

Best plate Willow Twig, C. M. Paisley, Hillsboro, first.

Best plate Jonathan, A. C. Mottaz, first; G. H. Perrine & Sons, second.

Best plate Rome Beauty, J. A. Gage, Texico, first; A. C. Mottaz, second.

Best plate Newton Pippin, A. C. Mottaz, first.

Best plate Minkler, C. M. Paisley, first; J. A. Gage, second.

Best plate Akin, A. J. Dunlap, Olney, first; H. M. Simpson & Sons, second.

Best plate Grimes Golden, J. A. Gage, first; A. C. Mottaz, second.

Best plate Winesap, H. L. Bieble, first; H. M. Simpson & Sons, second.

Best plate Rawle's Janet, C. M. Paisley, first; A. C. Mottaz, second.

Best plate Huntsman, A. C. Mottaz, first.

Best plate variety not named in above list, H. M. Simpson & Sons, first; A. C. Mottaz, second.

Class V.—Pears, Grapes and Quinces.

T. E. Goodrich, Judge.

Best plate Duchess, A. J. Dunlap, Olney, first.

Best plate Kieffer, A. C. Mottaz, Hardin, first; C. M. Paisley, Hillsboro, second.

Best plate quinces, S. G. Soverhill, first.

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Class VI.—Vegetables.

J. M. Jordan, Judge.

Best half peck early potatoes, W. B. Lloyd, Kinmundy, first; L. G. Hubbard, Urbana, second.

Best half peck potatoes for winter and spring, F. C. Hubbard, Urbana, first; L. G. Hubbard, second.

Best 3 heads celery, S. G. Soverhill, Tiskilwa, first.

Best half peck sweet potatoes, F. C. Hubbard, first; J. R. Reasoner, Urbana, second.

Best half peck turnips, S. G. Soverhill, first; L. G. Hubbard, second.

Best half peck beets, L. G. Hubbard, first.

Best half peck parsnips, F. C. Hubbard, first; L. G. Hubbard, second.

Best half peck carrots, J. R. Reasoner, first; L. G. Hubbard, second.

Best winter squash, J. R. Reasoner, first; F. C. Hubbard, second.

Best sample salsify, L. G. Hubbard, first.

Best sample winter radish, F. C. Hubbard, first.

Class VII.—Experiment Stations.

J. C. B. Heaton, Judge.

Most valuable collection from any of the Society's Experiment Stations, E. A. Riehl, Alton, first; John F. Jolly, Olney, second.

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THURSDAY—EVENING SESSION.

THE CULTURE OF FLOWERS AND THEIR INFLUENCE ON THE HOME.

MRS. O. M. MCELVAINE, BUSHNELL.

Among the decorations used to beautify the home there is none more attractive and cheering than beautiful plants in the windows.

Delicate climbing vines growing on trellises or trained about the windows, a few drooping plants in hanging baskets or in pots on side brackets or anywhere they can find place, enliven by their presence and refine by their influence.

The cultivation of flowers in a home should be far from an irksome task. It is a fascinating and healthful pleasure and the more one indulges in the care of window plants the more interested one becomes.

Happy contentment usually reigns in a home where the windows are attractive and cheery with healthy plants, whether they are blooming or only displaying thrifty foliage. True, they require considerable time and labor and oftentimes vigilant care to battle with the many pests which frequently attack them, but the pleasure derived from a window full of well grown flowers is well worth all the trouble and care they require. Every true florist is proud of his choice plants and flowers and cannot fail to notice the influence they exert for good on all who enjoy them, some of whom are sure to become imitators and successful cultivators.

Homes that have great bay windows facing the south or a broadside of plain ones in that direction may be made very attractive and cozy if filled with bloom, particularly if by some lucky chance the family sitting room or dining room have such an exposure. These windows should always be given to the flowering plants and vines which demand the most sunlight and contribute the most cheer.

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Growing plants can be used very effectually on the table and they should be as nearly perfect specimens of their kind as possible. No decoration serves a more pleasing purpose or adds a daintier touch to the appearance of the table than a center piece of flowers prettily and tastily arranged.

A certain amount of "greenery" should form a part of all floral decorations. If the leaves of the flowers used are not effective or pretty enough, maiden hair fern, smilax or the graceful feathery asparagus may be substituted.

There is no limit to the decorative possibilities of flowers when they are properly cut and arranged. That it takes an artist to produce the best results, no matter what the material, goes without saying. There are, however, a few simple rules, the mastery of which will go far toward producing effects. Perhaps the first thing to remember, and this you must have firmly fixed in your mind while cutting, is that the secret at the bottom of all floral decoration is to make not only the beholder but the flowers forget that they have been picked. You must yourself forget all fashions regarding their arrangement if you have ever known them and look to Nature, following her simplicity. Nature has furnished the flower with a stem, a fact which even fashion has at last recognized, therefore do you allow it as much stem as possible? Do not be afraid of sacrificing a bud or two, whether it be an American Beauty rose or a carnation that you are cutting. Flowers are no longer "bunched." We have learned from the Japanese the value of single branches and sprays. The most successful rose grower of my acquaintance, a lady whose rose garden is the despair of all her neighbors, uses no other method of pruning than just this cutting of roses for her own use and that of her friends for whom she gathers them recklessly in great armfulls, not hesitating to cut a branch two or three feet long with its many shoots, for the sake of a perfect climax in the shape of one or more exquisite roses with their buds.

A half-open, crimson rosebud or two in a wine glass, with a few of the shining green leaves is just the thing to dispel the blues at the breakfast table, while a choice nosegay of bright-hued flowers will help an invalid on toward recovery. A bouquet of roses at the table or by the window where you work is often a help and an inspiration. If cut early in the morning they will unfold slowly during the day; and since we cannot be out of doors all the time to enjoy the flower garden, let us bring the flower garden, or at least a portion of it, into the house that we may enjoy it there. Only let us not be selfish. The people who pass by are also fond of looking at the flowers and it is a great pleasure to divide with those less fortunate than ourselves.

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This little story may appeal to you as it did to me when I read it the other day, of a young girl dying in a London hospital. Hers had been a hard life, a bitter struggle against want and the great temptations that want means to a girl in a large city. As she lay on her death bed one memory survived. There was one wish that she longed to gratify and this is her story:

"Perhaps it won't seem much to you, but it meant more to me than I can tell. I was a little girl of six. We were very poor, my mother and I, and the Doctor came to see her. I stood at the side of the bed dreadfully frightened that the Doctor was going to hurt mother, and ready to do anything to keep him from her. He caught sight of me and I expect he saw all that I was thinking, for I must have shown it plainly enough. At any rate he came over and laid his hand upon me and spoke as if he loved me. 'Don't be frightened, little one,' said he; 'I shall try to make your mother better.' He had in his buttonhole a flower and he took it out with a smile and gave it to me. That flower was the only bit of love I ever had from anybody except my mother. And when I was left an orphan and all through my life to this day the memory of that flower has lived with me. Many and many a time I should have given right in and sunk right down but for the thought of that little bit of love. I should like to tell him what he did for me and to thank him."

The highest mission of a flower seems to be the cheer it scatters in a world of woe. The sunshine it brings where darkness was prevailing. A rosebud given with loving hands has brought joy to many a drooping spirit. It is a symbol of love and joy. One of the things that puzzles me most in this strange world is the slowness of men to perceive that one tiny blossom of sincere appreciation pinned in a man's coat is worth a score of the costlier wreathes laid on his grave. The flower is treasured by him long after it has withered, and it loses none of its fragrance.

In these days of no household help a busy woman's garden should be near the kitchen, where she can see the flowers while at work, and rest her eyes on their beauty. I have often been told that my choicest plants were in the back yard, I admit they are and for this very reason. They are where the family can see and enjoy them all through the busy days of summer. I do not cultivate my flowers altogether for the stranger that may enter my gate, nor for the company that summer vacations always bring. but for the pleasure of my own family first in mind. How often the children have called me to the door to notice how bright and

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fresh the mound of nasturtiums looked or asked me to look at the different colors in the pansy bed, or perhaps to guess at the length and breadth of a caladium leaf.

Cultivate the love of flowers in your children and do not consider the time lost in making a trellis for sweet peas and planting a choice variety of seeds for you will be amply repaid by having bouquets for your table the season through that will be appreciated by the youngest member in your family.

Mothers, do take time to help the little folks learn about birds and flowers. Let them eat plain bread and butter instead of pies and cakes. This will give you considerable more time, besides you will feel much better for the walk out in the fresh air. A little neighbor boy watched me plant my Madeira vine tubers last spring and said: "My, won't they look pretty when they cover that wire netting all over?" Children love flowers more than we realize sometimes, and this taste should be cultivated in their early years. Plant flowers that the little hands may gather and enjoy and if you will notice carefully they want choice, pretty blossoms as well as the older members of the family. If possible let the children have a flower bed their very own, and teach them how to cultivate and care for it, and they will enjoy their blossoms more than if the flowers were given to them. If you desire your plants to do their best by you, you must do your best by the plants. Give them a congenial home and conscientious care and they will prove very obliging and appreciative companions. If you love your flowers, they will know it and adapting themselves to graceful lines will show you happy, smiling faces. Flowers are cheerful, helpful things and the sight of their bright faces acts as a tonic. Attractive grounds add as much to the value of a place, be it large or small, as does a well built and commodious house. We can hardly set a money value on a shade tree that has stood near our door for many years, and yet its removal mars the attractiveness of the place to strangers as well as to those who love the tree.

The slope, or the irregularities of the lawn, the bits of ledge obtruding, the water standing in spring, the places where, in spite of our care, the grass will not grow, each and all of these are unsightly and entirely unnecessary, and a week's work draining, smoothing, sowing and setting out of trees and flowers is well spent and may count in the lives of our children and of ourselves for more than we know or can imagine.

There seems to be a disposition on the part of every enthusiast in the culture of flowers to attempt growing those plants most difficult to cultivate successfully, and where patient care and

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thoughtful attention is given they do thrive beyond the most sanguine expectations. We must expect failures and not grow discouraged, but try again repeatedly. 'Tis this patient perseverence which crowns the efforts of the successful florist.

We can get the largest returns from our flower gardens for the labor invested by planting shrubs and perennials. These will all know when spring has come without any thought on our part and with but little outlay of care, will make their annual returns of blossoms with each revolving year. Let those who plan on a larger scale, but whose means are limited invest as large a portion of their funds devoted to flowers as possible in the self-seeding annuals. These include many of our finest flowers, among which are the verbena, petunia, balsam, sweet alyssum, poppy, pansy and asters, making the majority of the most brilliant flowers of our gardens, and when it is considered that five or ten cents will purchase a package of seed of nearly all of these, even the housewives who are driven by hard necessity to exercise the utmost frugality can afford a garden for their own pleasure and the cultivation of the love of the beautiful in their growing families. Every farmer's wife should insist upon having plants and flowers, as they will be a source of much pleasure and will bring brightness into her somewhat monotonous and lonely life. Often it is impossible to have flowers in the yard, owing to depredations made upon them by poultry, etc.; in that case a veranda garden will be satisfactory and will enable one to keep quite a variety of plants. A nice collection of house plants may be obtained with little expense by growing them from seed and the process is very interesting. Plants grown in this way seem of more value than those bought from the florist.

Flowers are like music, in this respect, while you can enjoy them much without any knowledge of their construction, you will get infinitely more delight from them after a little study. The more you notice and examine the more you will enjoy them.

Under no consideration despise the wild flowers. There is some irresistible natural charm about them, a sort of breeziness of character, that distinguishes them from their cultured kin of the garden. Perhaps it is because they are nature's real children that she has been more lavish in her gifts. Any way, your true lover of flowers will never snub the dear old fashioned Columbine nodding down at us from its hillside home, or cease to love the fragrance of the wild rose.

The first great advantage of gardening with hardy flowers is that every dollar spent is a permanent investment that yields

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increasing returns every year so that if only a small part of the money annually spent in tender plants should be invested in hardy shrubs, bulbs and roots, our gardens would in a few years be fairly overflowing with beauty. Every one can have lilacs and roses and the hardy lilies and honeysuckles and lots of other pretty flowers if they only have energy enough to plant them and give them a little care afterward. To have these costs a little money, more work, some thought and lots of patience, but in the end it pays by making the home surroundings beautiful.

We form judgments of men from little things about their houses, of which the owner perhaps never thinks. In earlier years when traveling in the west, where taverns were scarce and in some places unknown and every settler's house was a house of entertainment, it was a matter of some importance and some experience to select wisely where you should put up. And we always looked for flowers. If there were no trees for shade, no patch of flowers in the yard, we were suspicous of the place. But no matter how rude the cabin or rough the surroundings if we saw the window held a little trough for flowers and that some vines twined about strings let down from the eaves, we were confident that there was some taste and carefulness in the log cabin. In a new country where people have to tug for a living no one will take the trouble to rear flowers unless the love of them is pretty strong. We were seldom misled. A patch of flowers came to signify kind people, clean beds and good bread. Mother Nature gives us grass for every day use; flowers to fill our more exalted moods just as she gives us plain bread and potatoes when we are really hungry and pudding when she only wants to tickle our palates. Some of nature's most wonderful creations are wrought of vines, airy, graceful draperies that soften and beautify whatever they touch. The cottage of the daily laborer, the log cabin on the frontier, take on an air of refinement when draped in a tangle of thrifty vine. Evidences of decay they mercifully hide from view and often they transform some dead monarch of the lawn and forest into a thing of seeming life and beauty.

The culture of flowers teaches us industry, patience, hope and faith. He who plants trees and vines, plants hope, comfort, blessings and love. He may not live to see the fruits that grow so beautifully, but his posterity will enjoy it.

What a lesson the flowers teach! The full bloom flower, the tiny buds nestling side by side, each filling its appointed niche, like one harmonious family.

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It takes light and heat and a pleasant situation to induce the rose to unfold its fullest size and beauty. So man can only attain his highest stature and truest worth in a pure atmosphere with uncorrupted surroundings.

God might have made the world without flowers, but He did not. He planned them in His wisdom as a means of grace and gladness for man. It would be a dull world without them. We need them at the festive board, in the pulpit and on the rostrum. The bride without flowers is shorn of her glory and love of the dear departed cannot be more tenderly expressed than by the mute blossoms laid on the bier.

The country home that has no flowers, no vines or shrubs, is a mockery of the name.

One might subsist there perhaps, but only a barren spirit, a soul bereft of the finer, higher attributes could be contented in so desolate a place.

Beautiful flowers! How they scatter sunshine up and down the land. Let us not forget to praise God that He decorated His earth with a profusion of bloom.

DOMESTIC SCIENCE.

Miss Isabel Bevier, University of Illinois.

Miss Bevier—Mr. Chairman and members of the Horticultural Society: You have assigned me a very large subject, but I do not wish you to feel that I am going to try to tell you all that can be told about it. I am going to talk to you about three phases of it; it has to do with the essentials of living, and the essentials of living are at least three: food, shelter and clothing. I have felt that perhaps it might be worth while to talk to you quite fully and freely and to bring, as it were, a seven years' report of work in the University of Illinois before you, in what we call there Household Science. I think I might say to you: Household Science in the University as it is and as it seems, because we have come upon a great many misconceptions about Household Science in the University. In the first place a great many people have not realized that it was one of forty or fifty departments of the University, and a good many people have called it a domestic science school. I realize that we suffer by that understanding, and I can explain to you what that means. A domestic science school would imply

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that that was the one thing that people did, that all of our energies were given to that work. The truth of it is, that one-third of the time of the girls is given to this work, the other two-thirds to University work. We divide our work on the basis that we wish to deal with these essentials of life—food, shelter and clothing.

We begin with the selection and preparation of food. It is a very good rule to catch your hare before you cook it. A good many mistakes are made in buying food. A great deal of time is wasted in trying to make food of something that never was fit to cook, and so one of the lessons is to begin with the selection of food, and then its preparation for the normal individual. First to know what the market affords, what are the ways of preparation, what are wholesome foods. The girls spend a year and a half in work with food, taking in first the selection and preparation; second, putting this stress upon the economic value of the thing, deciding what is best to buy and when it is best to buy and why it is best to buy and what you ought to pay for it, and along with the subject comes the study of the pure food laws and adulterations. We are having rather interesting reports in the class of things that the girls are finding out of the effects of the pure food laws; what difference is made in the case of some things that are really healthful now as to their real contents. And then we have a course that is called dietetics. That always frightens people badly, because they think when you talk about the diet they are always ill. Now, the truth of it is, it is the name of the daily food. Dietetics is supposed to be the principle of feeding, and so we have the feeding of the sick and the feeding of the well, and we try to have both sides and for the children. We have something for the care of the sick in the home, and I have the feeling that there is really a great field for work there. The trained nurse is not available for the average farm home, and it is sometimes pitiful and sometimes amusing, the notions that are sometimes indulged in, in regard to the care of the sick. But everybody recognizes that this is a necessity, so in connection with this course we have a woman physician come and give certain lectures, show about bandaging, show about the care of the patient in bed. Starting out, supposing some one comes in and says, "I know I am going to have fever," and the doctor says, "You are going to have a run of typhoid fever; prepare for it." Now, there are certain things that ought to be done; that room ought to be made ready and they ought to know how to take care of that room, before and after, and take care of the patient in it. So we have to take that in connection with our work on food.

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Another thing that seemed essential was the shelter question, and we count ourselves very fortunate in our University of Illinois, because in no other place that I know of could we have the help of the different departments. We can get somebody from the engineering department who can tell us about house plans. We have lectures in house planning, and the houses are planned to a scale. We shall have pretty soon fifty-nine plans on my desk, fifty-nine different houses, because I have fifty-nine people in that class. And we discuss the question of the town house and the farm house and all that comes into the making of the house. Then we have another talk by engineers to tell us about the plumbing, and the possibilities of the farm home. You know we are getting very rapidly past the idea that if you live in the country you must expect to be kind of uncomfortable and work hard, and when you come to town, then you buy a base burner and begin to be comfortable. That idea has passed out of farm life. People have decided that they will be comfortable just while they are living there, and they are having rural delivery, and they are having the stove and they are finding out that it is perhaps just as well to put one big stove in the basement and take care of that. No man cares to attend to ten stoves when one will do the work, so that this whole question is really coming to a much more sensible pass, so far as actual living facts are concerned.

I feel rather strongly on the planning of the farm home, because so little has been done in the real planning of the house. They have taken a town plan that looked well, as they say, and they have made it into a house for the farm, instead of making a house on the basis of the needs of the farm home. Now there are certain things that the farm home needs. The farm home does not need a reception room, because the custom is not to have formal callers in a farm home, but the farm home needs an office most assuredly. The day is past and the business on the farm is too large for the man to keep his papers in the clock. Don't you know, the valuable papers are kept in the clock, and those next in value are kept on the clock shelves. Our farms are too large and there is too much busines for the clock to hold it and so there is need for the office and the desk where the business of the place can be done. It does not need to be an extensive room, but it does need to be a room, and so there is a great deal to be done in the way of planning. The farm home needs a large dining room the day of the threshing and when the corn shellers come and butchers and clover hullers and all the other events of the year, and it needs not what the town house has, but it does need a large place so that this large procession of twenty men does not need to go

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through the kitchen. There ought to be some way of getting into the dining room without going through the workshop and there ought to be some way of getting water into the house without bringing it by main strength. So all these questions come in in connection with house planning. You see we have a pretty large field. Then when we get the house planned, it has to be furnished and it is quite desirable that it should be furnished according to its use; it is quite desirable that we should know what really is desirable and really is good, and so this course must of course touch more or less on the materials, on the fabrics for furnishing the home and there is one big name for it—that is textiles. We would like to have them know whether they are going to use cotton or silk or wool, and we would like to know that they learn these things in art and design, in order that they be able to do these things and do them well, in order that they understand the reason for it. There is not anything, perhaps, that people generally are so sensitive to as color. You sit in a room and just feel that there is something the matter with it, you don't know what, you don't know that the color is just rising up and screaming at you, and you don't want it screaming at you, you want to rest if you look at the wall paper, you do not want it to make you dizzy. The walls are the background and you want them to be background. Those are the things that come into this work on houses. When we get the house built from the ground up and we have it furnished, then we have the course in household management.

After the girls have had the work with the food and after they have had the work with the textiles, we have the problem of clothing. Now, where do you think would be the place for a woman to begin in studying clothing by the time she got to the University? Do you think she had better learn to set stitches? Would you think that a girl who had lived to be twenty years old had not learned to set stitches, at home or somewhere? I belong to the generation that was taught to make decent clothes and to do knitting. Of course that is altogether out of fashion, but I still believe that you ought not to treat your college women when they are twenty years old as though they were ten and teach them things that they ought to have known when they were ten; the next thing you will hear is that it is not university work, and a father will say, "I do not want to pay the money that it costs to live at the University of Illinois for my girl to learn to set stitches." There must be something else that she should do. That does not mean that she does not know how. I believe in her knowing how to set stitches. You have not compassed the question of clothes when you have learned to set stitches. Pillow cases do not make good dresses, you know; you can put them on for parties, perhaps, but they were

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not meant for dresses. I have had dresses that fitted me just about as a pillow case would. What was the trouble about that? The trouble was they did not have an idea of form or color or line. Perhaps that woman did know how to set stitches, I would not care about the stitches if there had been some shape to it, so it does not seem to me the setting of stitches is a university problem. The form and color and the adaptation of form and color to the woman, that is what I call university problems—art applied to clothing. And I would not begin there, because the woman buys the material. We begin with a course in textiles. The sewing goes out of the home more generally, because it is the one thing that can be put out; the woman cannot do everything, but she buys the goods, she spends the money, she ought to be made an intelligent buyer, she ought to know what is cotton and what is wool and what is silk and how to tell it and what is the use of each, and so we begin with the materials that people use. Then we have them study form and color and then we have the adaptation of materials to needs and then there comes the whole question of what is a healthful dress. There are the three heads that must be considered. There must be the economic buying, there must be the artistic making and the question of hygiene, and when you have entered any one of those three lines you have abundant work and work that may be called university work. Last year for the first time the girls put on dresses that they had made for themselves on that basis and we were pretty happy over that. Now, there is a lot more to be done on the side of hygienic clothing inside of this department, and just where we shall draw the line and what we shall do I do not know, but I believe that we are on the right line, I believe that we are doing the things that really belong to the university to do.

Now, another responsibility came upon us. There was organized in the university a teacher's department, a department of education, and a very great pressure was brought to bear that we should make teachers. They said there is the greatest need in the world for teachers; it is hard work to find a teacher. We have every one of us had more work to do than we could do, because while I was abroad Ohio State University came over and took the woman that we expected to take charge of the food work, made her head of their department, so by the time I got home she had moved. It was a good chance for her; we felt we ought to let her have that chance. The week after I got home they wrote that they would like another one; a girl came in to take graduate work, and I said to her, "I guess you had better take your graduate work there," so that took another one, and the rest of us have to work so much harder, because it is easier sometimes to do a thing your-

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self than it is to hunt up somebody and then tell them how to do it. I have not time to hunt up anybody. People say, "Well, it is very strange; here you have been running this department, and no teachers." Well, we have been running it for five years, that is, it is five years since we had our first graduates, and we have had twenty-eight graduates in those five years. Three of them are married, nine of them are teaching in public schools, five of them are teaching in university positions. Now, if you go over and ask the mathematics department if they can make a better showing in five years, why, very well.

I have another practice that I have observed. After our girls have gone to any school, when it gets to be toward the end of the year I write and ask how they feel about it, what they have done. You can come to my office and read the letters and without exception they have said they have done good work. So I would rather make five good teachers than fifty poor ones. I would rather be four years making five teachers than to be two years in making twenty, because it takes somebody smarter than I am to make a good domestic science teacher in two years, that is, if they get two years from the high school. I believe in beginning at the beginning and going as far as one can and then when going out to teach, do the thing that one does do reasonably well. I would like to have you come over to the department, I would like to have you really see what we are doing, and I would like to have you remember what we are trying to do, but do not compare us with the College of Agriculture and College of Engineering, because that is not a fair deal.

FRIDAY—MORNING SESSION.

Session opened with prayer by Rev. S. E. Fisher, Champaign.

The following report of the Committee on Final Resolutions was read and adopted:

Your Committee on Final Resolutions offers the following:

Resolved, that we express to Messrs. Gebhardt, Graves, Palmer and Spencer, delegates from Michigan, Missouri, Wisconsin and Iowa, our appreciation of their attendance here and our thanks for their interesting contributions to our program. We especially mention our pleasure in the interest shown by Mr. Gebhardt in displaying Michigan fruit upon our exhibit tables.

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Resolved, that we extend and renew our thanks to the University of Illinois, to its officers and those of its professors who have granted us the use of Morrow Hall and have made it so attractive by their display of beautiful and ornamental plants and flowers, also for the well lighted, commodious room wherein we exhibited our fruits.

Resolved, that we thank the city press for their notice and kindly interest and for their assistance in furthering the success of our meetings.

Resolved, that we thank the Twin City Cold Storage Co. for their kindness in caring for and storing the exhibits displayed here.

Resolved, that to all others who have aided in making this meeting pleasant and profitable we also express our thanks.

J. MACK TANNER,
J. R. REASONER,
R. B. HOWE.

The Committee on President's Address reported as follows:

Your committee wish to endorse fully the President's address, especially that part pertaining to the matter of forestry, also that part referring to the planting of more shade and ornamental trees, particularly those varieties of value for other purposes besides shade. Respectfully submitted,

W. S. PERRINE,
F. D. VORIS,
A. J. DUNLAP.

ELECTION OF OFFICERS.

Election of officers being next in order, the President appointed as tellers, Mr. Beale and Mr. Hartwell.

THE PRESIDENT—I would like to say at this time, before going any farther, that for the last two years I have been honored with the position as President. I appreciate the honor and confidence and wish to thank the members thus publicly for these, but at the same time I request now that they do not use my name in making the nominations. I am not a candidate and do not wish my name used. That is all I have to say, and we will now proceed with the nominations.

Mr. Goodrich then placed in nomination Prof. R. O. Graham of Bloomington, which nomination was seconded by Mr. Augustine. There being no further nominations, the Secretary was instructed to cast the ballot of the Society for Prof. Graham as President.

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Nominations for Vice-President being next in order, Mr. Dunlap placed in nomination Col. J. Mack Tanner, which nomination was seconded by Mr. Goodrich, and there being no further nominations, the Secretary was instructed to cast the ballot for Mr. Tanner.

On motion of Mr. Tanner, seconded by Mr. Hartwell, the President was instructed to cast the ballot of the Society for W. B. Lloyd as Secretary.

On motion of Mr. Augustine, seconded by Mr. Tanner, the Secretary was instructed to cast the ballot of the Society for J. W. Stanton for Treasurer.

MR. AUGUSTINE—I would like to hear a word from the President-elect.

PROF. GRAHAM—Mr. Chairman and members of the convention: It was the last thought I had in mind in coming here that any such office as this would be thrust upon me and it was only after considerable persuasion that I allowed the mention of my name in connection with it. I, however, thoroughly appreciate the honor that you have given me. I came among you an entire stranger to most of you a few years ago, and I am surprised that you have taken the action you have here today, but I assure you that I have no ax to grind with anybody, that all I desire is the very best horticultural society in this country, and I assure you, furthermore, that I shall put forth every endeavor in my power to further its interests and to make you at least not sorry that you have put me in this place. I thank you very much, gentlemen.

The location of place of next meeting was next considered. Mr. Augustine suggested that Bloomington be considered. After some discussion, a motion was carried that the Society meet again in Champaign next year.

REPORT OF NURSERY INSPECTION AND ORCHARD INSECTICIDE OPERATIONS.

S. A. FORBES, STATE ENTOMOLOGIST.

To the State Horticultural Society:

My last report on operations under the head of horticultural inspection closed with November 30, 1906. During the year following we have inspected 189 nurseries, and forty-nine small fruit

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plantations, from which plants were to be sold, making a total of 238 premises of this description. The nurseries aggregated 2,459 acres and the small fruit plantations 406 acres—a total of 2,865 acres for the State. I submit, as usual, a classification of the nurseries according to size, including in this table the small fruit plantations separately.

ACREAGE.	Nurseries.	Small Fruit Plantations.
100 acres or more	6	1
More than 50 acres and less than 100	5	0
More than 25 acres and not more than 50	14	2
More than 10 acres and not more than 25	26	6
More than 5 acres and not more than 10	23	9
More than 2 acres and not more than 5	27	10
More than 1 acre and not more than 2	34	10
One acre or less	54	11

This table shows a decrease since last year of 229 acres in nursery stock, amounting to 8½ per cent of last year's acreage, and an increase in small fruit stock of 167 acres—an increase of 56 per cent.

The inspection cost, this year, $1,266.14—an average expense of $5.32 per nursery. This is the largest average of any year since 1899, owing to the fact that practically the same territory had to be covered for a smaller number of nurseries, and also to the fact that the more general distribution of the San Jose scale in the vicinity of a larger number of nurseries has required much closer inspection in such cases than would otherwise have been necessary.

Besides nurseries we have inspected during the year 1,481 orchards and town premises, either infested or endangered by San Jose scale. On these inspected premises were 187,661 trees, 18,149 shrubs, and 38.4 miles of hedge examined with reference to scale infestation.

I have heretofore been obliged to engage my inspection force anew each season, being, as a rule, unable to furnish employment to inspectors between the first of April and the first of July. Under new conditions in the office, growing out of increased appropriations and the larger extent and greater variety of work undertaken, I shall now be able to hold my inspectors from year to year, em-

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ploying them profitably in other entomological work when inspection service is not needed, and in this way I hope to maintain a permanent inspection service which will give us the benefit of experience, and an opportunity to select inspectors according to the value of their work. This is becoming more important as the difficulty and responsibility of the work increase with the inevitable spread of the San Jose scale. Upon the care, thoroughness, and fidelity of the young men sent out in this service depends in very great measure the safety of the nurseries and the value of the stock distributed by them, and upon their experience and good judgment depends also the reasonableness of the requirements made for the protection of the nursery trade.

DR. FORBES—In every case where a nursery is so situated as to be exposed in any way to infestation, by reason of the presence of the San Jose scale on surrounding or adjacent trees, we are now undertaking to establish a clean zone, one-half mile across, around that nursery--making sure in the first place, of course, that the nursery itself is clean—in which there shall be no infestation by the San Jose scale or any other dangerous insect of a sufficient magnitude or intensity to endanger the nursery. For that reason we are going into every such situation and issuing the requirements which the law specifies, to the owners of infested premises, to clean up their premises because of the dangers which are involved to adjacent property. Where they do not do that within a specified time, then our own parties go there and take the measures prescribed, and under our law, as at present, the expense of this operation is collectible from the owner of the property, so that ultimately, with the exception of a small percentage which cannot be so assigned, the expense of this work does not come out of the State appropriations. I have several parties now in the State doing that sort of work in the vicinity of nurseries which are infested or endangered by the reason of infested premises in their neighborhood.

Then we have undertaken some elaborate and careful experiments on a rather large scale to see whether we may not find an acceptable, more convenient, less expensive, and more certain substitute for fumigation of nursery stock, which is now our main reliance in cases where nurseries have been exposed to the San Jose scale, but where the infestation has not become prominent enough to be detected by the naked eye. You know how hard it is to detect a San Jose scale. The insect may be considerably distributed through a nursery and any inspector who is not practically

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omniscient would not find it because it is too minute and easily concealed. Consequently in those cases where we have any reason to suppose that such conditions as those exist, we have to make a requirement of fumigation of the stock with hydrocyanic gas as a means of destroying any obscure or overlooked specimens. These obscure specimens are just as dangerous to the purchaser as would be a visible infestation. We have found a great many difficulties in the way of getting an effective fumigation, and there has come into frequent use in the east a dipping process in which nursery stock under these conditions is freed of the San Jose scale by dipping it into a fluid insecticide.

In order to test this method we had shipped up a lot of badly infested stock from a locality south of here. We treated it on our own premises—a part of it with hydrocyanic gas and the rest by dipping in a scalecide solution. We found a situation a few miles west of here where there was nothing within a mile that could possible be infested with the San Jose scale, and there in the middle of a corn field we have set out this infested stock, and we shall take careful note of it next spring and next fall to see what are the comparative values of these two processes. If we can find a dipping process which may be substituted for the hydrocyanic gas fumigation, it will be a great convenience and a great advantage in many ways to many nurseries.

I am proposing next to make an offer to the nurserymen of the State to this effect—if they will each of them select any one man in their employ whom they wish to be coached and instructed with reference to the San Jose scale and the whole process of fumigation, the construction of fumigation houses or outfits and the performance of the operation, and will send that man here, simply paying his expenses, we will coach him; and when we get through with him, we will test him as to his capacity to know the thing and to do the thing that we have been teaching him, and if he stands the test all right, we will give him a certificate to the effect that he knows the San Jose scale and that he knows the process of fumigation, and then we will accept his certificate of fumigation as equivalent to that given by our own agents. I have not allowed nursery stock to go out from an infested or dangerous nursery until fumigation had been performed under the inspection, or with the approval, of one of my agents. Ordinarily, since I could not be at the expense of maintaining at my office a force of fumigators large enough to answer all calls from distant parts of the State, we have, if possible, coached some man in each infested neighborhood who could be called upon, whom we knew to be reliable and whom we had instructed until we were willing to

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rely upon his work. Now we propose that each nurseryman may, if he choose, have an inspector coached; and we will provide a certificate to some man of his own force whose work we are willing to accept as equally reliable with our own, and upon the basis of whose statement we will issue certificates.

Then with respect to orchard work. The use of the lime and sulphur mixture for the San Jose scale has now become standard all over the country, and everybody I think who has any interest in this matter is thoroughly familiar with it; if not, you know where to get the information. But there is a great deal of objection to the lime and sulphur mixture. It requires to be boiled about an hour and this long boiling is an objection: and when you get the preparation made, it is disagreeable stuff to handle, both in its effect on the machinery used and its effect on the men. We have wished that we might find something as effective and as cheap as the lime and sulphur, and very much more convenient to use. There are two or three things we have found it worth while to experiment with in that respect, and we have an experiment running now on two orchards in Southern Illinois, selected after a careful examination and rented for that purpose. We have a lease of those orchards giving us complete control of them until the experiment is finished; and we have experiments out which will enable us to bring to a comparative test the ordinary lime and sulphur mixture, and a permanent solution of lime and sulphur, offered by the manufacturers under the name of the Rex Dip, which can be applied after a simple dilution. The third is the petroleum mixture which I have already referred to under the name of scalecide. This is really a petroleum emulsion so prepared that the oil does not separate, no matter how long it may be kept. It may be applied, consequently, after a simple dilution. These two substances are more expensive than the home-made mixture, more expensive so far as the mere first cost is concerned, but, on the other hand, they are very much more convenient; and it may be that, on the whole, they will not be more expensive on the tree. We want to find out the relative efficiencies of these three substances and their comparative cost as actually applied.

We are planning, also, an additional experiment, suggested to me since this series in Southern Illinois was started, with a substance known as carbolineum—one with which our friend Aldrich has had some experience and which he finds so effective against the other scale insects of the apple orchard that we are bound to try it on the San Jose scale.

Another thing that we are now just about to get at is a neighborhood demonstration of orchard methods with the San

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Jose scale. We are planning to send an experienced sprayer into here and there a neighborhood in those parts of the State where the San Jose scale is worst, and to advertise widely the fact that at such a place and such a time there will be a demonstration of the whole method of the preparation of the insecticide, of the apparatus to be used, and of the proper treatment of the tree, so that there may be an opportunity for everybody concerned to see by actual demonstration how the thing is done. We have done a good deal of that sort of thing before and with the best effects.

One other item in which I think you will be interested, in view of what has been said here about forest culture and shade tree work, is that owing to increased appropriations made by the legislature to the State Entomologist's office for this season, I have been able to specialize on the subject of shade tree insects, insects injurious to trees, shrubs and other ornamental outdoor vegetation in cities and in towns, in parks, boulevards, streets and private properties to the extent of assigning an assistant to that subject as his principal employment. This special assistant, H. E. Hodgkins, whom I obtained from the staff of the New York Experiment Station, at Geneva, I have established in Chicago because that is the place where the problem of the shade tree pests is most important. He has already critically inspected Lincoln Park from his standpoint, noting the exact condition as to insect injuries of every tree and shrub, and has made some more general inspections of the other parks, large and small, and of the principal boulevards of the park system. Cases of extensive and serious injury to old and valuable shade trees reported to me from Fairfield, Manchester, and Springfield have also been carefully investigated and reported on by Mr. Hodgkins, and we shall in time cover the State with a systematic survey of this interest, which is becoming annually more important.

MR. AUGUSTINE—I have three questions to ask and I will ask all three of them at once. In the first place I would like to inquire whether you do not think that cold storage, taking trees that are dug up in the fall of the year, as most of the nursery stock here is, and put into cold storage, whether this has not a tendency to destroy the scale? And the next question is this: It is my understanding that the scale spreads very slowly. How is it that it spreads from the outside on to small trees, one and two years old, so that in some localities large areas become thoroughly infested in a single summer? Next is a suggestion. I have been forced to the conclusion that fumigation weakens the life and strength of the tree; I believe that the trees are injured by fumigation. I have looked into that thing very thoroughly, and I do hope that some other method besides fumigation will be adopted.

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DR. FORBES—I am afraid that the cold storage of trees cannot be depended upon to have any important effect. The tree is sometimes a good deal colder, of course, outdoors in an ordinary winter than it would be in storage, and no outdoor cold of our region has ever killed the San Jose scale that I have ever heard of. Of course there is a limit to the spread of the scale, as one goes north, but it is a limit which seems to affect the rate of multiplication of the scale rather than actually to kill it. In Northern Illinois the San Jose scale is not nearly so injurious as it is further south, for the reason that it does not multiply so rapidly, it does not have so long a period of rapid multiplication in the summer, and so does not spread so rapidly.

MR. AUGUSTINE—In regard to the spreading of the scale, we had the impression that it spreads very slowly.

DR. FORBES—Well, that depends; when the scale is but sparsely present, when there is no very serious or extensive infestation, or any thick incrustation of the trees, it does spread rather slowly, as a fire will eat out around the margins of the place burned over; but when a large area is infested and a good deal of it badly infested, there comes about a kind of epidemic condition, and the scale spreads with an almost mysterious rapidity, nobody knows just how, probably in a good many different ways. Of course we know that it must be by mechanical means, since the insect has no power of locomotion which will enable it to travel to any considerable distance. It can get from one tree to another during the period of its active life, but within a very short time, a day or two at the utmost from the time of its birth, it must settle down, and thereafter it never moves again.

MR. AUGUSTINE—Do you think that birds are instruments in spreading?

DR. FORBES—Yes; birds sometimes convey the scale, as also do people going back and forth in the nursery or orchard, and if an infested orchard is being worked by horses, these sometimes rub off the scales from the infested branches and so convey the infestation. It has been noticed, for example, that where corn is grown between the rows of a partly infested orchard, the scale will spread much farthest in the direction of the rows of corn.

QUESTION—Do insects ever carry it?

DR. FORBES—Yes, a scale has sometimes been seen riding on a bug, but I believe he has never been seen actually to get off. Nevertheless, insects probably sometimes carry the scale. In respect to birds, there can be no question. Often we find the neighborhood

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of a bird's nest thoroughly incrusted by the San Jose scale, although there may be no others in its vicinity. This means that the birds occupying these nests have gone back and forth between their nests and infested orchards, bringing enough of the young scales from time to time to establish a new colony.

MR. AUGUSTINE—About the third question, in regard to fumigation?

MR. FORBES—I have frequently thought of making a series of experiments to determine the actual effect of fumigation on nursery stock, and then it has seemed a useless undertaking in view of the fact that several states of the Union require fumigation of all nursery stock grown by their own nurserymen and of all which comes within their borders, no matter whether it has been previously fumigated or not. This amounts to an enormous experiment on the effects of fumigation which nothing that I could do could for example, by entering it at certain ports, where it is fumigated possibly equal. One can only ship nursery stock into Canada, under government supervision, no matter what its previous treatment may have been. It is, of course, possible that damage is sometimes done by fumigation, and I know that there is a widespread feeling to this effect among nurserymen. But after all, what else can we do? We know at present of no acceptable substitute, and we must do the best we can with exact and careful fumigation and take such consequences—if there are any consequences—as inevitably come to us.

MR. AUGUSTINE—Ought not we to have a little instruction on how to fumigate, and may not some methods of fumigating be more injurious than others? I am satisfied in my mind, from observation and experience, that fumigation will injure a tree. I have seen the result from trees that were planted out and never amounted to anything that had been thoroughly treated.

DR. FORBES—In cases like that one has to know what would have happened to those trees if they had not been fumigated. Unless you make an exact experiment, take the same lot of trees, divide it into two lots, fumigate one lot and do not fumigate the other, and treat them exactly the same after setting them out, you really have nothing but the basis of a guess. What I am proposing it seems to me will be a help to that end. We are going to have here within a short time a sample fumigation outfit complete and correct in every particular. It will be subject to the inspection of any one who may be sent here, so that he may know how the work ought to be equipped in the first place. Then, as I said, we are going to give an opportunity for each of those persons inter-

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ested to come here and learn all about the business, and practice the operation under our instruction and criticism until we know he has mastered it. We are planning that for February. I am further going to urge each nurseryman to equip his nursery with a first-class fumigation outfit, to keep in his employ a man who knows how to fumigate, and to provide a supply of cyanide of potassium, 98 per cent pure, and a good grade of the commercial sulphuric acid necessary to fumigate. Then, if he receives stock concerning whose condition he has any doubt and wants to protect himself absolutely against the San Jose scale, he will pass this stock through his fumigation house, and if he wishes to send any of his own stock to states requiring a fumigation certificate, he may make sure that the work is thoroughly and safely done, which will be to the advantage of his trade.

MR. STANTON—I would like to ask if you have seen any indication of the scale spreading by the wind?

DR. FORBES—Yes, we have. We made some experiments with that; we find we can blow a young San Jose scale off a branch or twig where it rests with a sharp puff of the breath, and it is possible that a sharp, gusty breeze will carry it.

MR. SIMPSON—Supposing that you fumigate a tree that has San Jose scale enough to kill all the scales, how long will they stay on the tree? Suppose you take those trees out to plant them, how long will the dead scale stay on them?

DR. FORBES—That depends a great deal on the conditions to which the tree is exposed. The scales will presently become loosely attached to the bark, but they may remain there quite a time if they are not exposed to rain; they are much more readily washed off after they are dead.

MR. SIMPSON—About how long do they stay on ordinary seasons? Suppose you fumigated a plant at this time, about how long will they stay on before they drop off?

DR. FORBES—You mean in the storage house?

MR. SIMPSON—No, if you plant them outdoors.

DR. FORBES—Well, I should expect to see them all off within a month, at farthest, after they had died. They might be off within a week, or even within two or three days. It will depend, as I said, upon the weather, and somewhat, also, upon the insecticide used.

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MR. SIMPSON—I think the statement has been made that if a fumigation was successful you would not see any scales on the tree.

DR. FORBES—That is not so at all. The fumigation itself has no effect to loosen the scale, except as the scale itself dies and dries up, when its attachment to the bark of course is lessened.

A MEMBER—Is there any way of transporting the scale on fruit, or on branches removed from a tree that has been infested?

DR. FORBES—Yes, I can now say that with reference to the fruit, the fact has been definitely settled by observation. We had some ripe apples in my office last fall which were infested with young scales when they were brought in. These scales grew up under our eyes and reproduced young, which established themselves and had begun to grow when we peeled the apples and ate them up.

MR. DUNLAP—They are not likely to be transferred to trees and plants, are they?

DR. FORBES—There is only the smallest possibility that they will ever get from a ripe apple which has been put upon the market to a tree. There has never been a case of that kind reported so far as I know.

MR. HEATON—In trimming a scale infested tree and throwing the trimmings on the ground at the ordinary pruning time in February, would there be danger of scale escaping from those trimmings onto a healthy tree?

DR. FORBES—Well, so little danger that it is hardly worth considering, because the scale passes the winter partly grown and does not begin to multiply in our southern Illinois latitude. Of course it begins down there earlier than up with us—until about the first of June. It must complete its growth and get its power of reproduction before it could do any harm. The individual scale as it passes the winter, as it would be found in February, of course cannot move, it must stay where it is; it has lost its power of locomotion. If twigs are cut off at that time and allowed to lie on the ground, the probability that the scale could get food enough to complete its growth and reproduce would be very small. Still, the safest course would be to burn them up.

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H. M. Dunlap presented the following resolution:

Resolved, that the Executive Board be and is hereby requested to appropriate and pay over to and for use of the District Society any life membership fees that may be paid into the treasury of the State Society by the secretary or treasurer of any District Society.

After a lengthy discussion, the resolution was amended by adding the words, "and recommend to the several District Societies that they make such members members of the District Society," and was then adopted as amended.

MR. DUNLAP—Here is a question I ask because I think something ought to go into the volume in regard to the matter. I think it is one of the most important things that has developed this year. It is: "What is the value of cross-pollenization of the apple?" I would like to hear from Mr. Perrine on that subject, and from any one here that has had experience.

MR. PERRINE—I will say that at our own place we had some marked instances of cross pollenization, more marked than ever before, and we also visited Senator Dunlap's orchard and there the effect of the influence of one variety upon another was very marked. Ben Davis, for instance, next to Jonathan, was full enough, and Aiken next to the Ben Davis showed the effects of the pollenization of the Ben Davis on the Aiken and the Aiken on the Ben Davis in a very marked degree. We saw his orchard at Flora, where he has four rows of Ben Davis and four rows of Wine Sap and four rows of Rome Beauty, possibly Missouri Pippin, and so on across the orchard. That orchard in the early part of the season promised a good one-half to two-thirds crop and there were very fine results of cross pollenization there.

MR. DUNLAP—I want to say briefly, that my observation and experience this year and previous years prove that blocks of solid Ben Davis, for example, or any other solid variety planted, twenty to forty-acre blocks, is a great mistake, not only a mistake, an actual loss. I have known orchards of this character that have been more or less barren for the last six or seven years; where orchards that were carefully pollinated, in every year that we have had bad weather in the spring, the varieties that are intermingled in such orchards bear the better crops. Now, the practical deduction to be made from that is, that for matters of practical harvesting of crops you ought to plant four rows of one variety alternating with four rows of another variety throughout the orchard, and in that way you gather four rows of apples at a time. That is the prevailing method now in all the orchards. They will cross pollin-

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ate for about four rows, more or less. The first row we will say next to the pollinating variety will have a full crop, the next one will have a two-thirds crop, that is, this year, the next one may have one-third crop, while the fourth one does not seem to be affected at all—does not have any crop at all, but if you have a row on the other side of that fourth row, it gets a cross more or less of four different rows; the first two rows are the most perfectly covered, but the effects from both sides will pollinate four rows the best. One other thing, those varieties that bloom at the same time, at the same period, plant them side by side. Take the Rome Beauty, which is one of the shyest bearers we have in southern Illinois. If we establish a tree alongside of some other variety that blooms at the same time, because that blooms ten days later than some other varieties, in a year like this, when the season is backward and the early blooming varieties are delayed, those are the years in which you get the better crops from these late blooming varieties. Is it not true, when you look back upon the memory of your orchard, that in bad years it is the off varieties that bear the better crops, and in good years the standard varieties bear the best? Why? Because in good years the standard trees are in bloom and out of bloom in two or three days, and these late blooming varieties do not get the effects of the pollenization, but in bad years the blooming of the earlier varieties is delayed until the period of blooming of the later varieties and you get the cross pollenization of the late varieties by the bloom of the early varieties.

A MEMBER—Have any experiments been carried on that would give us definite information as to what varieties to plant together? We know pretty well what to do in regard to pears, and in regard to strawberries, also in regard to grapes.

MR. DUNLAP—I do not know whether that has been determined or not; Prof. Blair will have that looked up, but I will say that the Wine Sap is considered one of the poorest pollenizers of all. I think the Aiken is one of the best, that is my observation this year. In a little corner where there is a block of Ben Davis with Jonathan on one side and Aiken on the other, we packed thirty-two barrels of apples, in the next removed from that we packed sixteen, in the next one about five, so you can see the effects of pollenization there in the different varieties. It was the Aiken side of the Ben Davis where we had much fuller trees, than we did on the Jonathan side, although both did well so far as cross pollenization was concerned. It may be that right in that corner where they had the effects of both varieties, there were special facilities for pollenization.

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PROF. BLAIR—No experiments have been conducted here which will show the relative value of the different varieties as to cross pollenization. The New York Experiment Stations, both at Geneva and Cornell, and the United States Department of Agriculture have quoted considerable data from general observation, but no definite data is to be found in their monthly reports.

REPORT OF COMMITTEE ON MEMORIALS.

RESOLUTIONS OF RESPECT.

Whereas, Arthur Bryant of Princeton, Edgar Sanders of Chicago, James T. Johnson of Warsaw, Harry Beauman of Tunnel Hill and Allen Cope of Tonti, have passed away during the past year, and Robert Coith of Normal and Rev. Clairborne Hall of Athens have died within the past two years, it is but fitting that this Society should have the privilege of paying a tribute of respect to their memories for the services they have rendered this organization; therefore,

Resolved, that we cherish the memory of these true and loyal friends as honest, earnest and devoted workers to the cause of Illinois horticulture.

Resolved, that a copy of these resolutions be recorded in the minutes of our Society and also be sent to the afflicted families.

(Signed) J. C. BLAIR,
H. A. ALDRICH,
J. L. HARTWELL,
Committee.

On motion, the report was adopted by a rising vote.

Adjourned.

EXECUTIVE BOARD MEETINGS, 1907.

JANUARY MEETING.

The Board met at the call of the President in Hotel Illinois, Springfield, Ill., January 14, 1907, at 7:30 p. m. Present, Pres. Geo. J. Foster, Soverhill, Augustine, Reasoner, Schermerhorn, J. C. B. Heaton and Secretary Lloyd.

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Treasurer J. W. Stanton, Committee on Statistics, reported verbally that he had obtained the name and address of every township assessor in the State, excepting those in three counties. Moved by Augustine, seconded by Schermerhorn, that the treasurer be authorized to continue his work in gathering statistics. Carried.

J. W. Stanton, Treasurer, presented his bond. Schermerhorn moved, Reasoner seconded, that the bond be approved. Carried.

Augustine moved, Heaton seconded, that the Secretary be instructed to send twenty-five copies of Volume 40 of the Transactions of the Society, carriage paid, to each member of the Board, the Treasurer of the Society and the ex-President, H. A. Aldrich. Carried.

Moved by Schermerhorn, seconded by Soverhill, that $5.00 be refunded to F. C. Hubbard, Urbana, as he was already a life member of the State Society and intended the $5.00 paid December last to constitute him a life member of the Central Society. Carried.

Moved by Augustine, seconded by Heaton, that the next annual meeting of the Society be held in Champaign, and that the Treasurer, J. W. Stanton, be a committee to make arrangements for halls in which to meet. Carried.

Schermerhorn moved, Soverhill seconded, that the dates for the meeting be December 11, 12 and 13, 1907. Carried.

Augustine moved, Reasoner seconded, that $50.00 be appropriated to each district and $175.00, or such part as is necessary, be used by the State Society for *ad interim* work. Carried.

Augustine moved, Heaton seconded, that $100.00 be appropriated to each district for experimental work. Carried.

On motion of Schermerhorn $150.00, or such part as is necessary, was appropriated to each District Society for program expenses, upon filing receipted bills with the Secretary of the State Society.

Moved by reasoner, seconded by Augustine, that President Foster, ex-Secretary Bryant and Treasurer Stanton be a committee to accept or reject Volume 40 of the Transactions of the Society, when the printer is ready to deliver it, and the Secretary be instructed to draw a warrant for the payment of the printer's bill, upon the recommendation of the committee. Carried.

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Adjourned, to meet in regular biennial session at 8:00 o'clock January 15.

BIENNIAL MEETING.

Springfield, Ill., January 15, 1907.—Board met in compliance with the Constitution. Present, President Foster, Soverhill, Augustine, Reasoner, Schermerhorn, Heaton and Secretary Lloyd. Ex-President Aldrich and Treasurer Stanton were also present by invitation.

Moved by Schermerhorn and seconded by Heaton that R. A. Simpson be Director of Experiment Stations in the Southern District. Carried.

Moved by Reasoner, seconded by Schermerhorn, that H. Augustine, Normal, be Director of Experiment Stations in the Central District. Carried.

By "common consent" W. R. Soverhill was continued Director of Experiment Stations in the Northern District.

Moved by Schermerhorn, seconded by Reasoner, that a committee of three be appointed to confer with the authorities of the Experiment Station at Urbana, in reference to using a proper share of the "Adams Fund" in horticultural research and investigation. Carried. President appointed H. A. Aldrich, J. W. Stanton and H. M. Dunlap.

Moved by Augustine, seconded by Heaton, that the Secretary be authorized to draw a warrant to reimburse outgoing Secretary L. R. Bryant for necessary expenses in getting out Volume 40 of the Society's Transactions. Carried.

Moved by Schermerhorn, seconded by Augustine, that the incoming Secretary be required to make an inventory of all property coming into his hands and that he be required to make an annual report of the property on hand. Carried.

Moved by Heaton, seconded by Soverhill, that the Secretary be authorized to rent proper space in a fire-proof vault to store the Society's records and papers, and to see if some arrangement can be made with the authorities of the Agricultural College at Urbana, by which five copies of each volume of the Society's reports may be stored in the fire-proof vault in the Agricultural College building. Carried.

Moved by Schermerhorn, seconded by Heaton, that the Secretary be allowed $100.00 a year for office rent, light and fuel. Carried.

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Moved by Augustine, seconded by Soverhill, that the President appoint a legislative committee of three. Carried. J. W. Stanton, H. A. Aldrich and F. D. Vorris were appointed.

President appointed A. V. Schermerhorn, H. Augustine and W. R. Soverhill, Auditing Committee. A number of bills were reported as correct by the Auditing Committee, and the Secretary ordered to draw warrants for their payment.

Schermerhorn moved, Soverhill seconded, that Board adjourn, to meet at the call of the President. Carried.

SEPTEMBER MEETING.

Upon call of the President, the Board met at the Beardsley Hotel, Champaign, Ill., September 12, 1907, at 7:30 p. m. Present, President Foster, Augustine, Reasoner, Heaton, E. R. Jinnette. (the new member from the Southern Society in the place of A. V. Schermerhorn), and Secretary Lloyd. Treasurer Stanton and ex-President Aldrich were present by invitation.

Minutes of last meeting read and approved.

Treasurer Stanton, Committee on Halls, reported that Mr. Hatch of Beardsley Hotel would take care of us on the same terms as heretofore, $2.00 per day, but could not deduct anything for meals missed, nor help pay for a hall in which to hold our evening sessions. Moved by Augustine, seconded by Jinnette, that we hold all sessions of our next annual meeting in Morrow Hall. Carried.

Work on the program for the annual meeting was taken up, and Augustine moved, Heaton seconded, that the first session be at 10:00 a. m. on December 11. Carried.

Moved by Jinnette, seconded by Heaton, that the President appoint a delegate from our Society to the various horticultural meetings at Jamestown, Virginia, during the week September 20 to 27. Carried. President appointed H. Augustine, of Bloomington.

It was voted to change the premium list so that in Class 1 Entry 1 should read, "Best Collection of Apples, not less than six and not to exceed fifteen varieties," also making the first premium in Entry No. 2, $2.00, and the second premium $1.00.

Adjourned to meet at the same place, 8:30 a. m., September 13.

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September 13, 1907.—Meeting called to order by the President. Present, besides the President, Reasoner, Heaton, Augustine, Jinnette and Secretary Lloyd. Letter from Soverhill read, saying he could not be present.

Work on program was resumed and completed.

Moved by Augustine, seconded by Reasoner, that the Secretary be instructed to employ Miss Jacobson to report the three District and the State meetings on her terms, $150.00 and expenses. Carried.

Moved by Augustine, seconded by Heaton, that the President and Secretary call for bids for getting out four thousand copies of Volume 41. Carried.

Moved by Jinnette, seconded by Heaton, that the President and Secretary be instructed to secure fire-proof storage for the complete set of the Society's reports. Carried.

Moved by Augustine, seconded by Reasoner, that the President appoint one delegate to the meetings of the Horticultural Societies of each neighboring State. Carried.

Moved by Reasoner, seconded by Jinnette, that the Treasurer secure badges for the next annual meeting. Carried.

Moved by Augustine, seconded by Jinnette, that H. A. Aldrich be instructed to secure a good fruit exhibit at the coming annual meeting. Carried.

Moved by Heaton, seconded by Reasoner, that Superintendent Soverhill, of the Experiment Stations of the Northern District, make a condensed report from the Stations, to be given as part of the program at the next annual meeting. Carried.

Moved by Jinnette, seconded by Heaton, that the Secretary secure an assistant at the annual meeting, to keep a register book at the door, and that the reception committee see that every attendant registers. Carried.

The President was authorized to appoint a Superintendent and select the Judges of the Fruit Exhibit.

President appointed Jinnette and Heaton members of the Auditing Committee *pro tem.* A number of bills were reported by the Auditing Committee as correct, and the Secretary instructed to draw orders for their payment.

Adjourned, to meet upon the call of the President.

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NOVEMBER MEETING.

The Board met at the Belleville House, Belleville, Ill., Nov. 26, 1907, at 9:00 a. m., pursuant to the call of the President. Present, President Foster, Heaton, Jinnette, and Secretary Lloyd.

Moved by Jinnette, seconded by Heaton, that the Board adjourn until 4:30 p. m. Carried.

Board met according to adjournment 4:30 p. m. Called to order by President. Present, President Foster, Reasoner, Soverhill, Jinnette, Heaton and Secretary Lloyd.

The following bids for printing Volume 41 were presented by the Secretary: H. W. Rokker Co., 4,000 copies of 500 pages each, $1,285.50; Pantagraph Printing & Stationery Co., 4,000 copies, 500 pages each, at $2.50 per page; The Bowman Publishing Co., 4,000 books, to contain 496 pages each, $1,495.00.

Moved by Soverhill, seconded by Jinnette, that the President and Secretary let the contract for getting out Volume 41 to H. W. Rokker Co., Springfield, Illinois, at the price named. Carried.

President appointed Jinnette and Heaton members *pro tem* of the Auditing Committee.

Adjourned to meet at 7:30 a. m., November 27.

November 27.—Board met pursuant to adjournment. Called to order by President. Present, President Foster, Reasoner, Soverhill, Jinnette, Heaton, and Secretary Lloyd.

Moved by Jinnette, seconded by Heaton, that the President appoint as delegate to the Wisconsin State Horticultural meeting, to be held next February, the person named by the Northern Society as their delegate. Carried.

Moved by Jinnette, seconded by Lloyd, that J. W. Heaton, New Burnside, be the delegate to the meeting of the New York State Fruit Growers' Association, January 8 and 9, 1908. Carried.

Moved by Soverhill, seconded by Heaton, that J. M. Jordan, Savoy, Illinois, be the delegate to the annual meeting of the Missouri Horticultural Society. Carried.

The Auditing Committee reported a number of bills as correct, and the Secretary was instructed to draw warrants for their payment.

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Adjourned to meet at the Beardsley Hotel, Champaign, Ill., at 8 p. m., Dec. 10, 1907.

DECEMBER MEETING.

Champaign, Ill., Dec. 10, 1907.

Pursuant to adjournment board met in Beardsley Hotel at 8 p. m.

Present, President Foster, Augustine, Reasoner, Heaton, Jinnette, and Secretary Lloyd; also ex-President Aldrich and J. M. Jordan, new member from Central Society, by invitation.

Minutes of last meeting read and approved.

Secretary presented a letter from the chairman of the committee appointed by the American Pomological Society to secure legislation in this country that will give us a law similar to the "Fruit Marks Act" in Canada, asking the co-operation of our Society. Augustine moved, Heaton seconded, that the letter be presented to the Society during its meeting to be held tomorrow and days following. Carried.

Secretary presented letter from the Secretary of the Ohio State Horticultural Society asking for an exchange of fifty to one hundred copies of our annual report for an equal number of their report, that their Society may have ours for distribution among its members. Moved by Augustine, seconded by Jinnette, that Secretary send 50 copies by prepaid freight. Carried.

Secretary presented letter from Massachusetts Agricultural College asking specimens of apples belonging to the Ben Davis family. By vote the President and also the Superintendent of fruit exhibit, were instructed to give notice of the request that exhibitors might comply.

Heaton moved, Soverhill seconded, that Secretary be authorized to draw warrants for premiums and program expenses. Carried.

President appointed Jinnette a member of the Auditing Committee *pro tem.*

A number of bills were presented and referred to the Auditing Committee and by them reported as correct. On motion of Augustine, seconded by Heaton, they were allowed and Secretary instructed to draw warrants for their payment.

Adjourned to meet at call of the President.

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Champaign, Dec. 12, 1907.

Pursuant to call of President, Board met in Beardsley Hotel at 10:30 p. m. Present, President Foster, Augustine, Jinnette, Heaton, Soverhill and Secretary Lloyd. Aldrich and Jordon by invitation.

Moved by Heaton, seconded by Augustine, that J. L. Hartwell be allowed $20.00 on expenses as delegate to Americal Pomological Society. Carried.

R. A. Simpson, Director Southern District Experiment Stations, presented his report and also his resignation. In his report he stated that the Superintendent of Station No. 15 had removed to California and that there were some matters at the station that needed looking after at once.

Augustine moved, Heaton seconded, that resignation be accepted and E. R. Jinnette of Anna be appointed to look after Station 15, and report to the new Board at its January meeting. Carried.

J. W. Heaton of New Burnside tendered his resignation as delegate to the meeting of the New York State Fruit Growers' Association to be held in Syracuse, N. Y., January 8 and 9, 1908. Heaton moved, Augustine seconded, that resignation be accepted and F. D. Voris be the delegate, with S. G. Soverhill as alternate. Carried.

The Auditing Committee reported a number of bills as correct, and the Secretary was instructed to draw warrants for their payment.

Adjourned *sine die*.

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REPORTS OF EXPERIMENT STATIONS, 1907.

STATION NO. 1—PRINCETON.

*ARTHUR BRYANT, SUPERINTENDENT.

The only apple tree that bore fruit this season was the Salome.

The Perfection and Wilder currants are recommended.

The Ridgely chestnut bore a fair crop; bears early, is hardy and its planting should be encouraged.

STATION NO. 16.—DIXON.

J. L. HARTWELL, SUPERINTENDENT.

There are no plums or apple fruits to report because of late freezing.

PEARS.

Lincoln—Has never blighted for me. One small tree bore a peck of handsome fruit this season—all other varieties a failure.

STRAWBERRIES.

The season has been fairly favorable for strawberries in this locality; a little too much moisture during fruiting season. Little damage from frost at blooming time.

Abingdon—Fairly productive; strong plant; sets large; bunches of large oblong berries; nearly all berry stems prostrate. Ripens early; light red; good flavor; some rust; season medium; staminate.

*Deceased. Report furnished by his son, Guy A. Bryant.

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Florella—Similar in shape, size and color to Abingdon; better foliage; possibly not so productive; stem fairly erect; little or no sign of rust; season medium; firm; promising.

Ekry—Large, conical; good flavor; firm; some rust, otherwise good foliage; probably good shipper; color dark; ripens early.

North Shore—Stand nearly a failure; but few berries set; some tendency to woody tip.

Nehrings Gem—Not enough foliage; fairly productive; rusts; firm, dark; abruptly conical; medium in size and season.

Cardinal—Impeffect stand; good foliage; large, round; slightly conical; dark; firm; promising.

Pride of Valley—Nothing to justify first part of name.

Arnout—Something like Clyde, especially in its faults; very productive.

Elmo—When this report was made this variety looked very promising—June 23—but not far enough along in season to show its real merits or faults.

New Home and Dandy—Not enough plants set to make test.

I usually set six or twelve plants of a variety in station. The following varieties have fruited twice before this season in Station 16 and were so promising that they were given somewhat a commercial test, 100 plants of each variety being set: Uncle Jim, Auto, Oom Paul, Yant. They all have a little tendency to overbear. If kept thin in row I think would prove profitable commercial varieties. They are all medium to late in season.

Arkansas Black—True to color; small; poor plant and foliage; somewhat resembles old Wilson; not desirable.

Virginia—Spherical; light color; early, resembling "Wood" or "Old Cumberland;" not so large; am not pleased with it.

Chesapeake—Very strong, vigorous plant; thick, leathery foliage; belongs to a type of which Bubach is a representative, which, as a rule, are shy bearers on my soil; season late.

Hummer—Plant similar to Chesapeake; much more productive; firm; regular in shape; large; fair flavor; would be popular as market berry.

Worthington—Fairly productive; low growth, rather poor foliage; very firm; dark; medium size.

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Advance—No good.

Gen. Joe Wheeler—No Good.

Buster—Late; good plant; leathery foliage; immensely productive; large, roundish; light color; not firm; deserves a more euphonious name.

Crozier—Large, productive; fairly good foliage; very prostrate; ripens unevenly.

Early Beauty—Small; poor foliage; worthless.

Wild Wonder—Small; poor foliage; not productive. Why it was so named is the "Wonder."

BLACKBERRIES.

Blower—Seems to be midway between a blackberry and dewberry in habits of growth.

Was not damaged by winter. Healthy, vigorous grower; very thorny; bore well for first season; large, long, good flavor. Its half creeping habit will make trellising necessary.

RASPBERRIES.

Eaton—Was badly affected with root gall early in season, but made good growth later; bore almost no fruit and that quite late.

King—Much more vigorous growth than Eaton, being larger; late.

P. Farmer—Black-cap; very promising; extra grower; bore good crop for first season and has made an immense growth since; no sign of disease.

Iowa Wragg (Red)—Gives promise of value; berry extra large; will not separate from stem until quite ripe; late and for first year prolific.

GRAPES.

Report made September 10.

Vincennes—Red; feeble grower; poor foliage; one of the two vines bore no fruit; just beginning to color.

Brilliant—Foliage poor; attacked by fungus; fruit did not ripen.

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Wyoming Red—Bunch medium in size, compact, being smaller than Woodruff Red; nearly ripe September 10; healthy, vigorous grower; promising.

Early Ohio (Black)—As early as Moore's; smaller; thick skin; fair quality berries; drop some.

Prentiss (Red)—Fairly prolific; poor foliage; not desirable.

McPike—As last year set heavy crop. Too much to ripen well; foliage rather weak; made very little growth on account of extremely large crop of fruit set.

Green's Early (White)—Prolific; a little undersize; foliage good; may be valuable as an early grape.

Moore's Diamond (White)—Some leaves attacked by fungus; vine of great vigor; fairly prolific; bunch and berry similar to Niagara.

Green Mountain—Similar to Green's Early; berry a little smaller and possibly a little earlier; needs thinning.

Eaton (Black)—Berry next in size to McPike; not prolific; some leaf blight.

Ive's Seedling—No sign of weakness in foliage; berry and bunch somewhat smaller than Concord; tough skin; prolific; doubtless a valuable market grape.

Eureka (Riehl No. 10)—Black; about season of Morris; good quality, but too small to compete with Moore's Early.

Riehl 15—Reject.

King (Black)—Berry large; good bunches for first season's bearing; foliage good; vigorous vine.

STRAWBERRIES SET SPRING OF 1907—NOTES TAKEN SEPT. 10.

Pan-American—Of the seven plants set, each produced from five to eight berry stalks and only one set new plants. Have picked ripe berries for several days. There are many blossoms just opened and still to open. Am anxious to know how new plants are secured.

Autumns—Similar to Pan-American in bearing qualities, but not quite so prolific in fruit but more in plants.

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STATION NO. 17—SCOTTSBURG.

O. M. McElvain, Superintendent.

The past season has surely been disappointing. Very warm last of March, causing trees to start and then turning cold all through April. Frost nearly every night in this month, and continued cold in fore part of May, catching nearly every kind of fruit except Persimmons, which always wait to see what kind of spring we are going to have before they come out in bloom. Wish we had some of them crossed on our apples and peaches this season.

All tree fruits a failure on grounds, but trees made a good growth, and are in fair condition for next year.

Most of the berry crops were fairly good.

STRAWBERRIES.

Autumn did not do very much. Seem rather weak for a pistilate variety.

Pan-American bore more fruit than *The Autumn*, but is not prolific enough for a commercial berry. It does not send out runners, but forms new crowns around the old head, and this makes it a poor plant producer. It would do to raise as a novelty and to have a few berries out of season.

New Home—Fine shape, fair. size and color; quite prolific, but very poor quality; would not recommend.

Virginia is promising; has quality; fairly prolific; medium in size. Will try another season with more plants.

Reasoner's—Nos. 269, 324, 325 are all quite strong, clean looking plants, and quite similar, both in fruit and plant, yet are distinct in individuality; berries above medium size; good shape and color; fair quality; promising; worthy of trial.

McFarland—Chestnut bore a few nuts of good size and quality. Many burrs were not filled. Tree is quite young

Nothing new in raspberries or blackberries.

Hurcles and *Illinois* grapes were the best we had this season.

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STOCK SET SPRING 1907.

Apricots—2 Superb, 2 Royal, 2 J. L. Budd, 2 Nicholass, 2 Harris.

Crabb—2 Soulard.

Cherries—2 Schmidt, 2 Compass, 2 Windsor, 2 Allen.

Plums—2 Surprise, 2 Klondike, 2 Maquoketa.

Quinces—2 Rea, 2 Orange, 2 Champion, 2 Meeches, 2 Bourgeat, 2 Missouri Mammoth, 2 Anger.

Apples—2 Garden Royal, 2 Opalescent, 2 Winter Maiden Blush, 2 Seedless, 2 Stayman's Wine Sap, 2 Kinnard, 2 Virginia Beauty.

Pears—2 Gans, 2 Bar Seckle.

Peaches—2 Bailey Seedling, 2 Canada, 2 Wager, 2 Belle of Georgia, 2 Hiley, 2 Slappy, 2 Kalamazoo, 2 Lorentz, 2 Wonderful.

Almonds—2 Hard Shell, 2 Soft Shell. Neither of the Soft lived.

Currants—3 Diploma, 6 North Star, 6 Ogden's Black, 6 Lee's Prolific, 6 Black Champion.

Gooseberries—2 Columbus.

Blackberries—5 Robinson, 5 New Mammoth, 5 Himalayan Giant, 5 Origen Evergreen, 5 Matchless, 5 Golden.

Dewberries—2 Mayer Hybred.

Raspberries—6 Hudson River, 5 Surprise, 5 October Yellow, 3 Mexican.

Grapes—6 Elvira, 5 Champion.

Strawberries—6 Arctic, 6 Startler, 6 Laxton's Noble.

Logan Berry—5 plants.

Primus—1 plant.

Phenomenal Berry—5 plants.

Strawberry Blackberry—10 plants.

Japan Giant Chestnut—2 trees.

Mullberry—New American, 2 trees.

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STOCK SET IN 1907.

Strawberries—Cooper, Pan-American, Autumns, Helen Gould, Golden Gate, Gill, Great Scott, Goldsborough, Gov. Rollins, Dicky, Abingdon, Mammoth Beauty.

Raspberries—Superlative, Pride of Ohio.

STATION NO. 18.—HEBRON.

H. G. STREET, SUPERINTENDENT.

Early in October, 1906, we had a very hard frost (the first of the season) which killed leaves on grapes, plums and apples, while yet very green; then in March, 1907, the warm weather started the fruit buds on Burbank plums and when trees finally leaved out several of the Burbanks were too dry to start. All others were O. K.

STRAWBERRIES.

Strawberries were a fair crop but nearly two weeks late, also only lasted about two weeks after the first picking. Dunlap, Warfield and Splendid seem hard to beat.

PLUMS.

Lombard plums blossomed out first. Two days later the most of the natives were in full bloom, then a long rain set in which lasted six days without drying off the blossoms; the result was that Lombard set a good crop while others were very scattering except Wolf and Wyant's. Burbanks blossomed but very little as fruit buds dried up and fell.

APPLES.

Apples made a fair growth and all buds have matured well but trees too young to bear.

STOCK SET IN 1907.

Grapes—One Sunrise and one Banner.

Apples—Two Ben Hur, two Giant Jenetin, two King David, two Delicious, two Lievland Raspberry and two Florence Crab.

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Pears—Two Lincoln, one Triumph, one Fame (dwarf), and one King Karl (dwarf).

Five small trees marked Gratis (choice varieties); look like peaches.

STATION NO. 4.—SAVOY.

H. M. DUNLAP, SUPERINTENDENT.

The spring of 1907 opened with very warm weather during the month of March, followed with long continued cold through April and the first half of May. During the month of April there were but five nights without a frost and some of them quite heavy ones, with some four or five severe cold spells when the ground was frozen. Two heavy freezes occurred during the first part of May when the bloom was out on the apple. While it looked as though we might have a good half crop of apples in May and first part of June the "June drop" took about everything with the result that what crop there is to report upon from this station is very slight indeed.

The Ben Davis made the poorest showing. The bloom and foliage being worse hit by the frost than on other varieties.

The trees in the station were sprayed three times with the standard mixture of Bordeaux and Paris green. The foliage was good on nearly all the trees until frost.

Peach bloom as well as pear was killed by the spring frosts and not by the winter cold. Like the apples it looked for a time after the bloom had fallen that there would be a half crop of peaches, but they finally dropped from the trees.

There were a few quince fruit. A little less than a bushel of fruit was harvested from six bushes. The Apple quince yielded the best crop.

There were no plums bearing this season.

The loss of all kinds of fruit may be directly attributed to the frosts.

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Ornamentals—1 Catalpa Bungel, 1 Teas Weeping Mullberry, (never grew), 2 Norway Spruce, 2 Diamond Willow, 1 Black Hills Blue Spruce, 1 Colorado Blue Spruce (did not live), 2 Norway Maple, 50 California Privet, 2 Alanthus.

STATION NO. 8.—NORTH ALTON.

EDWIN H. RIEHL, SUPERINTENDENT.

There was less than half a crop of strawberries this year. The following are the varieties which did well:

Arlington—Perfect flower, resembles Bubach. Plant is large and vigorous, productive. Berry is firmer and of better quality than Bubach. Recommended for planting.

Ekey—Perfect flower, strong, healthy plant and productive. Berry pointed, very bright, glossy color, firm and of good quality. This berry has shown up exceptionally well and brings the top price. Highly recommended.

W. W. W.—Perfect flower, fairly early and one of the most productive this year. Fruit large, oblong with a blunt end, rich dark red color, firm, quality good. Stands wet weather well and is a promising sort.

Beedler—Perfect. This seems to be the most promising late variety ever fruited at this station. Plant remarkably strong and healthy. Berry averages larger than any sort ever tested here. Quality very good and a good shipper.

Normal—Perfect, resembles Brandywine very closely but is more productive.

Early Bird—Perfect, a seedling of Senator Dunlap which it resembles, except that it is a little darker in color, firmer and ripens several days earlier and better quality.

Wren—Imperfect. Another seedling of Senator Dunlap which was originated at this station. Plant is strong and healthy. Produces more perfect berries than any sort at the station. Fruit medium to large, quite firm, the best quality, season from medium to late.

Crimson Crimson—Perfect flower, better than Gandy which it resembles, but is a little better bearer, especially on this ground.

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Ernie—Perfect flower. Plant not vigorous, though healthy; productive. Berry medium size, firm and good quality, dark red, glossy and is profitable for market.

Prof. Fisher—Perfect flower. Has done well for past five years. Plant is strong and healthy and even where plants are very thick they set a big crop of fruit. Light color and firm, good quality and profitable for market.

Mrs. Fisher—Imperfect flower. The most robust growing plant at the station. Fruit of immense size, fairly firm, bright color, good quality and very productive.

The following varieties are worthy of further trial:

Cardinal, Thompson, Ben Davis, Roosevelt.

The following varieties which closely resemble the New York seem to be of little or no value:

New York, Auto, Wonder, Capt. Peary, Gen. DeWet, Corsecan.

These sorts are all healthy and vigorous growers, fruit large to very large, of rich mealy quality but are all unproductive.

The following varieties have proved to be of no value at this station:

Arkansas Black, Perfection, Louis Hubbach, Alice Hathway, Satisfaction, Arnolds, Stateline, Hoffnagle, Wild Wonder, Fremont Williams, New Home.

BLACKBERRIES.

Eldorado—Best record of any sort tried at this station for many years. Large, jet black, very productive and fine quality.

Ward—Bushes very thrifty and healthy. Fruit very large, shiny black and fine flavor. Promises to be a very fine berry.

Blowers—A few specimens on one year plants only. The berry was the largest grown at the station. Quality excellent. We cannot tell about this berry till next year.

Ruby Red—Not to be recommended.

Manitou—Very vigorous and very productive, being large and pointed, quality superb, very firm. This sort is highly recommended for home and commercial use.

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Kenoyer—Winter kills very badly and when it does get through the winter the berry seems to go all to pieces.

Prize—Late, bore a fair crop of large berries, quality good. Plant strong and healthy.

Illinois—The best all around early berry; quality the best.

Mersereau—Bore a heavy crop of fine fruit and is worthy of further trial.

Leader—Worthy of further trial.

RED RASPBERRIES.

Worthy—One of the most vigorous and healthy varieties. Very productive and above the average in size. Very early and firm with good quality.

Iowa—Very large in size, productive, a good bright color and of good quality. Inclined to crumble. A great sort for exhibition and family use.

Golden Queen—Golden yellow, very productive, good quality and fine for home use.

GOOSEBERRIES.

Crop very light this year.

Portage—Is the very best yet fruited at this station.

CURRANTS.

Perfection—Best ever fruited at this station.

APPLES AND PEARS.

Complete failure this year.

PEACHES.

Admiral Dewey—Ripens with Triumph, good size and color, best early yellow variety and does not rot.

Carman—Bore a fine crop of good fruit.

Greensboro—Bore a full crop and was the most profitable crop this season.

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Belle of Georgia—Ripens with Elberta. The best white freestone yet tested.

CHERRIES.

All bloomed well but frost killed all except two sorts.

Gould and *English Morrello* set full crops but were destroyed by curculio.

GRAPES.

Eclipse—Ripens before Moore's Early and holds on wonderfully well and for a long period. Fruit a little smaller than Concord, best quality. Vine exceptionally vigorous and healthy.

Headlight—Early, holds on exceptionally well, bright to dark red, bunch compact, size about the same as Delaware.

Wine King—Fair crop but of no special value.

King—Nearly as large as McPike, quality about the same as Concord. Best of the large sorts for market.

McPike—Good crop this year. The largest black grape known and the very best quality but skin is too thin for shipment.

Mrs. Munson—Bore a full crop of most excellent fruit. Ripens late.

Lutie—Best early red grape. Ripens with Moore's Early.

Hopkins—Bore a heavy crop of good late fruit. A fine wine grape.

Stark Star—Bore an enormous crop but did not mature.

PLUMS.

Frost killed all sorts except America which was loaded with fruit but curculio destroyed them all.

CHESTNUTS.

Trees are yet young.

Rochester—Best variety so far. One two-year tree which was planted last April bore nineteen perfect nuts.

Paragon, Ridgely, Coe, McFarland and *Apha* bore at from three to five years old. The nuts from these are much larger and equally as good flavor as the natives.

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STATION NO. 8B.—ALTON.

E. A. RIEHL, SUPERINTENDENT.

APPLES.

Two *Akin* trees, one of the willowy type and one of the upright habit, has shown marked productiveness for several years past, in favor of the willowy type. This variety has been showing up well and is recommended for that soil. However, in other sections it is inclined to be a shy bearer some years but the fruit is excellent and brings the best prices.

Clayton bore a full crop this year. Fruit large, good quality, but a very irregular bearer.

Greenville—Is an early fall apple of excellent quality.

Ingram—A seedling of the Rawls' Janet and resembles it in many respects but has not many of its parents' faults. It does not bear in clusters, is of more even size, does not rot or check and is freer from insect pests. The fruit is borne all through the tree, is of good quality and is recommended for commercial planting.

McMahon White—Bore a good crop. It is large, acid and fine for cooking; season follows Maiden Blush. Recommended for planting.

Oliver (Senator)—This sort has fruited the past four years and is a beautiful large red apple of excellent quality. Season follows Jonathan. Recommended for planting.

Stayman—Is a regular bearer, large and of excellent quality but inclined to drop a little too early.

Watwood and *Arkansas Black* have shown up poorly for the past few years.

PEARS.

A total failure this year.

PEACHES.

Partial crop only.

Carpenter Cling—Bore a good crop again. Season is September and always brings a high price. Recommended for planting.

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PLUMS.

A total failure.

CHERRIES.

A total failure.

CHESNUTS.

Only a fair crop caused by late frosts.

Boone—Though blooming when frosts were the worst bore a fair crop. Ripens quite early, of good quality and is recommended for market.

Cooper—Bore for second time on grafts inserted spring 1905 a full crop of large nuts, of beautiful color and excellent quality. Highly recommended for planting. Can readily be grafted on native stock.

Other varieties worthy of trial are *Rochester, Ridgely* and *McFarland.*

WALNUTS.

Japan's Sieboldi and *Californias* were killed in bloom. Some years they give large crops. Fruit of poor quality.

Thomas—Has borne twice on grafted trees and believed to be one of the best native walnuts. Bears young and very proific; nuts large, of good quality and excellent cracking nuts. Believed to be worthy of general planting for market.

FILBERTS.

Eight bushes panted in the original station by Mr. Boone have been thriving and bearing well. Twenty bushes of our planting have been bearing well. This nut is recommended for trial.

PECANS.

Of the twelve southern sorts that have been tried all have been winter killed except *Centennial* and *Bolton.* Several varieties have been planted a number of times. As yet the southern varieties are not very promising for this section.

GRAPES.

C. A. Green—Fruited for the second time but so far it seems identical to the Niagara.

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Carlton—Fruited for the second time. Red in color, healthy, quite productive and of the best quality. Worthy of trial for family use.

Regal—Fruited for first time. Red, berry large, bunch small, very productive and good quality.

RASPBERRIES.

Manitou—Fruited again this season and has proved to be the best red variety so far fruited, very productive and of excellent flavor and a good grower.

BLACKBERRIES.

Ward—Very productive and good quality. One of the best new varieties in cultivation. Recommended for planting.

Kenoyer and *Blowers* have shown up unfavorably.

STATION NO. 11.—OLNEY.

J. F. JOLLY, SUPERINTENDENT.

The following trees were received and planted this year:

Apples—Ten Northern Spy.

Pears—One Warden, one Triumph, one Fame, one King Karl.

Fruit generally was a failure.

STATION NO. 15.—VILLA RIDGE.

E. J. AYRES, SUPERINTENDENT.

STRAWBERRIES.

All varieties reported on trial last year discarded excepting Mrs. Miller and Roosevelt.

Mrs. Miller—An excellent variety for both home and market. Berries large, bright and firm, very prolific, making a fine show when crated; flavor very good.

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Roosevelt—Plant fine in every respect except its foliage; little small. Berries small to medium, color bright red. In flavor one of the best yet sent to this station. Too small for market; very highly recommended for home use.

The following fifty varieties were planted this season—thirty-six plants of each variety—one-third matted, half matted and hedgerow.

Dornan—Foliage and growth good. No rust, makes plenty of runners.

President—Foliage and growth poor, rusts some.

Hummer—Foliage and growth good, rusts a little, runs freely.

Pride of Michigan—Foliage and growth good; no rust, runs freely.

Oregon Ironclad—Growth good, foliage poor; no rust, free runner.

Oakes Early—Growth poor, foliage good, no rust, free runner.

Stephen's Late Champion—Growth rather poor, foliage good, no rust, rather poor runner.

New Home—Growth fair, foliage small, no rust, free runner.

Commonwealth—Growth poor, foliage fair, no rust, free runner.

Morning Star—Growth fair, foliage good, no rust, free runner.

Ninety-Six—Growth fair, foliage good, no rust, free runner.

Virginia—Growth poor, foliage small, no rust, free runner.

Mrs. Miller—Growth and foliage good, no rust, free runner.

Fairfield—Growth medium, foliage good, no rust, free runner.

Haverland—Growth medium, foliage good, no rust, runners medium.

Climax—Growth poor, foliage good, no rust, few runners.

North Shore—Growth and foliage good, good runner, no rust.

Sample—Growth and foliage good, no rust, free runner.

Great Scott—Growth and foliage good, free runner, no rust.

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Governor Rawlins—Growth medium, foliage good, no rust, free runner.

Gill—Growth poor, foliage small, no rust, few runners.

Goldborough—Growth and foliage good, good runner, no rust.

Pan American—Worthless here.

Helen Gould—Medium growth, foliage good, no rust, free runner.

Thompson's 400—Growth good, foliage good, no rust, free runner.

Chesapeak—Growth rather poor, foliage good, free runner, no rust.

Bowers—Growth rather poor, foliage medium, no rust, free runner.

Autom—Very poor showing.

Crimson Cluster—Growth medium, foliage good, no rust, free runner.

Catherine—Growth and foliage good, no rust, free runner.

Evening Star—Growth medium, foliage good, no rust, free runner.

Alington—Growth poor, foliage good, no rust, free runner.

Dandy—Growth and foliage good, free runner, no rust.

Good Luck—Growth and foliage good, no rust, free runner.

Nelving's Gem—Growth poor, foliage good, no rust, poor runner.

Alberton—Rather poor growth, foliage good, rust none, poor runner.

Arnout—Growth and foliage medium, some rust, runners only fair.

Coopers—Growth fair, foliage good, no rust, free runner.

H. L. E.—Growth fair, foliage good, no rust, free runner.

Ekey—Foliage and growth good, no rust, runs freely.

Texas—Growth and foliage good, no rust, runs freely.

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Nehamn's Gem—Growth poor, foliage small, no rust, free runner.

Banner—Growth and foliage poor, no rust, free runner.

Mammoth Cluster—Growth medium, no rust, free runner, foliage good.

BLACKBERRIES.

Blower—Good healthy growth.

Kenoyer—Growth good.

King—Small healthy growth.

Ward—Good growth.

Early King—Good growth.

Austin—Fair healthy growth.

DEWBERRY

Premo—Fair healthy growth.

Canterrand (black cap)—Growth good.

Plum Farmer (black cap)—Growth poor.

Herbert (red)— Growth good.

Eaton (red)—Growth good.

Rouby (red)—Growth only fair.

Munger—All dead.

Thwack (red)—Growth good.

GRAPES.

I have discarded all the Munson varieties excepting the following:

W. B. Munson—An excellent variety for both home and market.

Delago—An excellent medium size grape for home use.

America—Rather small black grape of peculiar flavor, liked by many, with scarcely any pulp, fine for those who discard the seeds, good for home use.

Herman—An excellent medium size black grape, quite late, healthy and vigorous, recommended for home use.

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Carman—Large, juicy, good flavor, foliage healthy, growth strong, very little rot when not sprayed, excellent for home use.

Fern Munson—Growth strong, foliage healthy, size medium to large, good flavor, not a good shipper, excellent for home use.

Herman Gouger—An excellent small late black grape, no rot, valuable for its lateness, recommended for home use.

Headlight—Very small, excellent grape, of good quality, vine poor but healthy growth, recommended for home use.

W. B. Munson—A grape liked by many, somewhat shy as a bearer but otherwise fine for home use.

Perry—Very nice medium size black grape of excellent quality when fully ripe, recommended for home use.

Hopkins—Very much resembles Perry but stronger growth and better bearer, good home grape.

The following not of Munson variety are worthy of culture:

Eclipse—Still holds its own as to the best early grape, no grape comparing with it in earliness and healthy foliage, size of bunch and berry. Nearly equal to the Concord in flavor, better than the Concord, destined to hold a large place for home and market.

Hicks—This disputed variety, although resembling in many respects the Concord, is both larger and sweeter, more compact bunch, more vigorous vine, with hardier foliage and rots less than that variety.

Rockwood (black)—Foliage and growth good, very little rot, berry size of Concord, excellent flavor, early, too tender for market.

Early Daisy (black)—The only grape that compares for earliness with Eclipse, about one week later than that variety, good bearer, flavor rather poor.

Moore's Diamond (White)—In growth, hardiness and size of bunch resembles Niagara, but of much better flavor, skin too thin and tender for market but most excellent for home use.

Green Mountain—This excellent little white grape stands at the head of the list for home use, for hardiness, productiveness and fine flavor, quite early.

NEW VARIETIES.

The following new varieties of grapes received this year are having good healthy growth: *Illinois, Lutie, King, Sunshine* and *Banner*.

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IN MEMORIAM.

Arthur Bryant.

Arthur Bryant was born October 15, 1834, on the old Bryant homestead two miles south of Princeton, Illinois. His death occurred unexpectedly in his office at the Princeton nurseries May 13, 1907, at the age of seventy-three years. Arthur Bryant was a son of Arthur Bryant, Sr., one of the most conspicuous figures among the early horticulturists of Illinois, and was a nephew of William Cullen Bryant and John Howard Bryant.

Arthur Bryant's education was more or less typical of the pioneer days. Growing up amid the toils of a frontier life he acquired his early education in the public schools and continued his study under the tutorage of Rev. A. B. Church and Mr. James Smith of Princeton.

Mr. Bryant's business career was wholly connected with the vocation with which his name has ever been associated by his fellows—horticulture. Arthur Bryant, Sr., had started a nursery business in 1845 and his son grew into it almost from his boyhood. In 1857 he became a partner in the business. Some ten or twelve years later he purchased the land on which the nursery now stands, and in 1869 he started the business now represented by the Princeton Nurseries. In 1875 he assumed the full management of the enterprise, and from that time to his death has given it unceasing attention. The wide reputation of the plants grown by the firm of Arthur Bryant & Son amply testifies to the success of Mr. Bryant's business career.

As a citizen, Mr. Bryant was not an aspirant for public offices. He took little active part in politics, but his clear good sense and his unquestioned integrity brought to him various local offices which he filled with acceptance to his fellow citizens. Toward the close of his life he was for several years president of the Bureau County Early Settlers' Association.

In his role of horticulturist, however, Arthur Bryant was called upon early and often to fill some of the most important offices in the realm of Illinois horticulture. He was an active member of

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both the Illinois State Horticultural Society and the Northern Illinois Horticultural Society, his connection with these two organizations dating from 1866 and 1868 respectively. In 1871 he was elected vice-president of the Northern Society and from 1882 to 1898 he filled almost continuously either the office of president or vice-president of that society. It 1886 he was president of the State Horticultural Society and from 1891 to 1897 was its treasurer. At the Columbian Exposition Mr. Bryant was one of the three members of the committee that had charge of the famous Illinois horticultural exhibit. Indeed, Mr. Bryant's name was actively connected with the State horticultural work for forty years.

Mr. Bryant's most noteworthy contributions to horticultural literature are his historical sketches of early Illinois horticulture. His long life began far back in the pioneer days and his father's still earlier experiences gave him a peculiar insight and sympathy with those early days. He did, however, contribute various papers on practical questions of the day, and few wrote more sensibly and concisely than Arthur Bryant.

Arthur Bryant was married in 1864 to Elizabeth Hughes. In 1875 he moved from the old homestead to the present location. He leaves his widow, four sons, and three daughters to mourn his loss. The children are: Mrs. M. N. Baldwin of Princeton, Ill., Harry G. Bryant, Davenport, Ia.; Guy A. Bryant and Miss Cassa Bryant, Princeton, Ill.; Lester P. Bryant, New York City; Ralph C. Bryant, New Haven, Conn.; and Mrs. Curtis D. Brigham, Coffeyville, Kan.

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Edgar Sanders.

September 29, 1907, Edgar Sanders, eminent horticulturist and pioneer florist, entered into his rest, at the ripe age of eighty years.

Few men were so well known in floral circles in the State of Illinois as Edgar Sanders. To few has it been given to render so great service to the calling which was his vocation. As grower, as dealer, as contributor to the agricultural and horticultural press, Edgar Sanders gave his best to the interests of his profession. His was the privilege of watching that wonderful development which has marked horticultural progress in Illinois during the last fifty years. Indeed his was the privilege of playing a considerable part in that evolution, during the progress of which commercial horticulture, at least, had its inception and made its growth, and ornamental horticulture took on new and splendid proportions.

Edgar Sanders' life was marked by much of great interest. It is a story of progressive achievement and kindly living in a world of the beautiful. Mr. Sanders was born in Sussex county, England, October 10, 1827, near East Grinstead. He followed his father's occupation as a gardener and before leaving England in 1853 he had successfully filled the position of head gardener in two private places near Egham, Surrey. For four years Mr. Sanders engaged in nursery and garden work at Albany, N. Y., and contributed articles to "The Country Gentleman." In 1857 he came to Chicago, where he erected a fifty-foot greenhouse and commenced to grow a general stock of flowering plants. Seven years later, in 1864, he opened the first permanent flower store in the city of Chicago. Suffering a check in the loss of his store in the Chicago fire of 1871, he did not reopen until 1874, retiring finally from the direct work of florist in 1882.

Edgar Sanders was well known to the horticultural world through his contributions to the press. At various times he was attached to the staff of "The Country Gentleman," "The Prairie Farmer," "The Orange Judd Farmer," "The London Gardener's Chronicle," "The American Gardener's Chronicle" and "The Florist's Exchange." He was the first temporary president of the American Association of Nurserymen, in 1876, and president in

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1884. In 1858 he helped organize the Chicago Gardener's Club and was at one time its president. He was also chief executive of the Chicago Florist's Club and was for many years its treasurer. His activity extended to the organizing of the Cook County Agricultural and Horticultural Society and to many other societies and associations. He will be remembered as an active member of the Northern Illinois Horticultural Society and a frequent contributor of papers before that organization.

The following tribute from the Florist's Exchange expresses something of our appreciation of the man:

"He loved his chosen work for its own sake, and while in the pursuit of it he sought a comfortable living for himself and his dear ones, he was the least mercenary of men. The glamor of profit connected with the propagation and introduction of new plants never had any attraction for him at any time, so far as we know. Not along these lines will the name of Edgar Sanders long remain enduring in the horticultural annals of America, but because of a life well spent, and duty as a gardener, as a florist, and as a citizen, well and faithfully performed.

"The great popularity of Mr. Sanders proceeded from his unvarying amiability, from the unfailing interest he took in all that made for the welfare and delectation of his fellow man, from his rugged honesty, his complete unselfishness, and last but not least, from the pride he took in his profession and all that dignified it. The heritage he leaves his sorrowing ones is not that of great riches, but it is the priceless inheritance of an unsullied name; and with it is the inspiring knowledge that, by all to whom he was known, their unanimous and deserved opinion of him is, he was in every respect a man. *Requiescat in pace*, our faithful co-worker, our friend of many years' standing—Edgar Sanders!"

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EDGAR SANDERS

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PROCEEDINGS

OF THE

FORTY-FIRST ANNUAL CONVENTION

OF THE

HORTICULTURAL SOCIETY

OF

NORTHERN ILLINOIS

HELD AT

POLO, ILLINOIS, DECEMBER 4 and 5, 1907

Reported Under Direction of
W. B. LLOYD,
Secretary State Society

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OFFICERS FOR 1908.

PRESIDENT.....W. R. SOVERHILL, Tiskilwa
FIRST VICE PRESIDENT.....GUY A. BRYANT, Princeton
SECOND VICE PRESIDENT.....L. H. CUTLER, East Dubuque
THIRD VICE PRESIDENT.....W. S. SANFORD, Polo
SECRETARY.....JACOB FRIEND, Nekoma
TREASURER.....CHAS. HEY, Dixon

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CONSTITUTION AND BY-LAWS.

CONSTITUTION.

ARTICLE 1. This Association shall be known as the HORTICULTURAL SOCIETY OF NORTHERN ILLINOIS, and shall embrace the counties of Bureau, Boone, Cook, Carroll, DuPage, DeKalb, Henry, Grundy, Jo Daviess, Kane, Kendall, Kankakee, Lake, Lee, LaSalle, McHenry, Ogle, Putnam, Rock Island, Stephenson, Whiteside, Winnebago and Will.

ART. 2. Its object shall be the advancement of the Science of Pomology and the Art of Horticulture.

ART. 3. Its members shall consist of annual members paying an annual fee of $1; of life members, paying a fee of $5 at one time, and of honorary members, who shall only be persons of distinguished merits in Horticulture or kindred sciences, who may by vote be invited to participate in the privileges of the Society. The wives of members shall be members without fee.

ART. 4. The officers shall consist of a President, three Vice-Presidents, a Secretary, Treasurer and an Executive Committee, which shall consist of the President, ex-President, First Vice-President and Secretary, all of whom shall be elected at the annual meeting and serve one year, or until their successors are elected.

ART. 5. The Vice-President first elected shall be a member of the Executive Board of the State Horticultural Society.

ART. 6. The Association shall hold annual meetings at such time and place as may be determined by the Executive Committee.

ART. 7. This Constitution may be amended at any regular meeting by a two-thirds vote of the members present.

BY-LAWS.

1. The President shall preside at all meetings of the Society, call meetings of the Executive Committee, and, under its direction, have a general superintendence of the affairs of the Society and

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direction of the expenditures of its moneys. He shall deliver an annual address on some subject connected with Horticulture, and shall appoint committees, unless otherwise ordered.

2. The Vice-Presidents in the order of their appointment shall act in the case of the absence or disability of the President, and shall by correspondence and personal intercourse with the horticulturists of their several localities, endeavor to organize local societies, obtain accurate information of the condition and progress of Horticulture therein, and report annually in writing to the Society.

3. The Secretary shall record the proceedings of the Society, file and preserve all papers belonging to it, and prepare its reports for publication. It is expected that the outgoing Secretary will complete the report of the past year.

4. The Treasurer shall receive and keep an accurate account of all moneys belonging to the Society and disburse the same on the written orders of the President, which he shall retain and file as vouchers; he shall make an annual report to the Society of the receipts and disbursements, which, with the vouchers, shall be referred to the Executive Committee.

5. These By-Laws may be amended at any regular meeting of the Society by a two-thirds vote of the members present.

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LIST OF MEMBERS.

HONORARY MEMBERS.

Lloyd, Prof. J. W.....Champaign, Ill.
Lloyd, W. B.....Kinmundy, Ill.
McElvain, O. M.....Bushnell, Ill.
Reihl, E. A.....Alton, Ill.
Richardson, E. A.....Sparta, Wis.

LIFE MEMBERS.

Bryant, G. A.....Princeton
Bryant, H. G.....Princeton
Cutler, Louis H.....East Dubuque
Gerbracht, J. H.....Spring Grove
Gilbert, W. H.....Belvidere
Hartwell, J. L.....Dixon
Hansen, N. E.....Brookings, S. Dakota
Hertz, Henry L.....628 N. Hayne Street, Chicago
Humphrey, A. G.....Galesburg
Johnson, F. C.....Kishwaukee
Kaney, August.....Polo
Lloyd, W. B.....Kinmundy
McGaffy, Ansel.....Woosung
Periam, Jonathan.....526 Englewood Avenue, Chicago
Shaw, Frank M.....Oneida
Small, Len.....Kankakee
Soverhill, W. R.....Tiskilwa
Sperbeck, M. V.....Oshkosh, Wis.
Swift, E. C.....Ottawa
Swigart, Roy.....Dixon
Walstrom, J. A.....Princeton

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ANNUAL MEMBERS.

Bryant, Guy A.....Princeton
Bryant, L. R.....Princeton
Davis, H. D.....Polo
Friend, Jacob.....Nekoma
Hey, Charles.....Dixon
Hunt, George A.....Woodstock
Keithley, A. T.....Dixon
Joiner, Alvin.....Polo
Mason, W. K.....Buda
Moore, Amos.....Polo
Powers, Austin.....Sterling
Rudd, W. N.....Morgan Park
Sanford, W. S.....Polo
Soverhill, S. G.....Tiskilwa
Stewart, W. J.....R. F. D. No. 1, Moline
Stoddard, R. B.....Sterling
Street, H. G.....Hebron
Waterburg, H. S.....Polo
Tobey, J. W.....Polo

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PROCEEDINGS

OF THE

FORTY-FIRST ANNUAL CONVENTION

OF THE

Horticultural Society of Northern Illinois

HELD AT

Polo, Ill., Wednesday and Thursday, Dec. 4 and 5, 1907.

WEDNESDAY—MORNING SESSION.

The convention was called to order at 10:30, Acting President W. R. Soverhill in the chair.

The session was opened with prayer by Dr. J. H. More.

MAYOR'S ADDRESS OF WELCOME.

Hon. H. Wales, Mayor of Polo, welcomed the Society to Polo in the following address:

Mr. President and Members of the Horticultural Society of Northern Illinois: I count it a pleasure, and an honor, to welcome you to our city which, while you tarry with us, regard as your home.

We welcome you the more readily and cordially because we recognize your devotion to a noble calling, which in its development adds to the comfort of our lives, loads our tables with fruits, shades our homes, pleasure grounds, and the ways of traffic, with beautiful trees and borders our pathway with flowers.

Your studies and labors bring you in touch with nature. While there are for you such questions as "What shall we eat,

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and what shall we drink, and where with all shall we be clothed," the materials with which you work, the springing twig, the stately tree, with arching branches, the rustling leaves, the blooming flowers, the golden fruits, the sunshine and the dew, the pattering rain and balmy breeze and even the rustling storm, all combine to bring about you an atmosphere of poetry that hallows and irridates your toil.

You deal with life, which, whether in the violet or oak, the rose or bramble, the mite or man, begins in embryo, and passes through infancy, youth and maturity, to final decline. All life is correlated, and knowledge of its development in one department of nature is a key to its mysteries in all its manifestations. So we congratulate you that your daily cares and toils prepare you better to understand the growth and development of human society, its duties and destinies.

Your activities are along two parallel lines, the useful and the beautiful, that are always within greeting distance of each other. You strive to make fruits better and more abundant, to embower homes and parks with trees, vines and flowers, to make the highways and byways of life more and more an inspiration to nobility of sentiment and action.

In such lines we expect benefit from your presence among us, and we will heartily welcome any suggestion you may make in the way of making our city and homes more attractive and beautiful.

We welcome you to all we have, and hope to profit by your counsels and discussions so when you again honor us by your presence you may see a nearer approximation to the ideal city beautiful.

We congratulate ourselves that when you walk our streets you will not have thrust on your attention that offensive and cruel blight that curses so many communities, and is always a degrading force in private and civic life.

For over forty years our city has firmly refused to sell for a paltry fee the privilege of ruining its sons and debasing the average of its citizenship to a conscienceless interest that falsely and impudently claims the right of legitimate commerce.

As a result we have no shanty town suburb to show you, or for shame hide from you. Ours is a city of homes. We cannot say we are entirely free from the nuisance of the "joint," but we will be when we have made our environment prohibition territory by virtue of our State local option law, and Congress has made the Hepburn-Dolliver bill the law of the land.

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We have provided for our children a school building and teaching force to which we are pleased to call your attention. These with churches, library and other public buildings and appliances place our city in rank with those who seek to work out in public and private life the highest ideals of a clean, kindly, and intelligent citizenship.

Our sewer system which will promote proper sanitation and conveniences for nearly the whole platted area of our city, approaches completion. We are proud that our public treasury is clean and not indebted one cent for our public utilities and comforts to the bonus of the accursed license fee.

Again I bid you welcome, thrice welcome, again and again.

Mrs. Charles Hey, Dixon, in behalf of the Society, responded to the address of welcome.

MRS. HEY—Mr. President, Members of the Northern Illinois Horticultural Society and Citizens of Polo: I assure you that it gives me great pleasure to be allowed the privilege of responding to this very courteous and hearty address of welcome, to which we have just listened from Mayor Wales. In thanking him I wish to say that this Society knows that in selecting Polo as its place of meeting, it has made no mistake. Twelve years ago it was our good fortune to hold a meeting of this kind in this place and we remember the gracious hospitality with which we were greeted. We remember the beautiful decorations with which this same hall was decorated at that time, we remember the substantial help that we received from the citizens of Polo with music and valuable papers on our program. All these things led us to come again and I am sure that the greeting that we have received and the decorations which greet us make us feel that we have made no mistake. There are several reasons why it is fitting that horticulturists should meet in Polo. For one thing, we know that the majority, I believe, of the citizens of Polo are agriculturists, wide awake agriculturists, too, as the poultry and corn show which is held here each winter testify; it is worth coming many miles to see. Their schools and library and the equipment belonging to their schools, are of the very best. Horticulturists do not meet primarily for their own benefit, these meetings are not held primarily for the benefit of those who make fruit growing their business, but rather that farmers and villagers, people who have even a small plat of ground of their own, may grow their own fruit. I do not know of any other business in which the people gather together once a year and travel for miles to hold a meeting and invite the public and give everything away that they know about their business;

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but that is the way horticulturists are gotten up. They believe in themselves, they believe in their business, they believe that if everybody could be induced to grow their own fruit, the world and the people would be the better for it, and so we have these meetings and we hope that a great many of the citizens of Polo will be enough interested in the work to become members of the Society. It costs you but one dollar and you get a report of all the proceedings of the Central, Northern, Southern and State Societies. It is a well bound book of about 500 pages and well worth your dollar. Another reason why, as the mayor has already said, it is a good thing for the horticulturists to come to Polo is that for more than forty years the citizens of this town have never reached the point when they wished to raise revenue for their expenses out of the wasted lives of their men, the broken hearts of their women and the blighted lives of their children, and this Society congratulates you upon this fact. Horticulturists everywhere are known to be temperance people. The saloonkeepers never take up a collection and hire a brass band to meet us when we come to town, and so I think it is fit that we should come to Polo, because there is a bond of sympathy between us, there is a community of interest and I hope that our meeting here will prove mutually beneficial and again I thank you, Mr. Mayor, for your gracious words of welcome and the hospitality of the citizens of Polo.

REPORT OF SECRETARY.

JACOB FRIEND, NEKOMA.

MR. FRIEND—I think that by rights I should have had a written report, but in that I failed and I will give you a short report orally. I suppose the last season must go on record as one approaching the point of failure in horticulture as nearly as any season that we have experienced in a long term of years. The farmers' cellars are wthout fruit; the farmer who has depended upon the market in buying his supply of fruit has to do without it, and to my mind it emphasizes the fact that if there is a farmer in Northern Illinois who expects with any degree of certainty to have a supply of fruit in his cellar, he must plant it and grow it himself. The farmers ought to be the first ones in the land to have a supply of fruit, and whatever might be the meaning of this Society, in whatever direction they might put forth their efforts, it seems to me that one of the things that we should see to, is that an interest is awakened in the farmer for the planting and growing of fruits. There are three things that he must do, he must plant, he must cultivate and he must spray, and until the farmers will do that they will be without fruit when a scarcity comes.

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TREASURER'S REPORT.

Charles Hey, Treasurer, in account with the Horticultural Society of Northern Illinois:

RECEIPTS.

December 4, 1906, to balance on hand	$169 90
To membership fees	19 00
State appropriation	150 00
Total receipts	$338 90

EXPENDITURES IN DETAIL.

December 4th, 1906—	
Joliet Rep. Printing Co.	$ 10 00
Whitehead Hoag Co., badges	8 50
Mrs. H. M. Dunlap, program expenses	5 59
J. L. Hartwell, premiums	4 00
J. L. Hartwell, program expenses	13 68
Emma Hey, program expenses	12 25
Chas. Hey, premiums	15 25
J. H. Turner	4 50
W. L. Powers, program expenses	9 20
Jno. Powers, premiums	1 50
Jacob Friend, premiums	1 00
Jacob Friend, services as Secretary	25 00
Jacob Friend, program expenses	6 58
J. Trelevan, hotel bill	5 50
J. Trelevan, premiums	75
L. R. Bryant, R. R. fare	5 04
H. M. Dunlap, program expenses	6 20
J. Bevier, program expenses	10 15
H. T. Thompson, program expenses	14 41
H. M. Dunlap, hotel expenses	2 50
A. Bryant, delegate to Wisconsin	10 40
Francis G. Blair, program expenses	12 00
Eugene Davenport, program expenses	12 75
Geo. Abbott, premiums	3 75
J. H. Gerbracht, program expenses	5 62
W. R. Soverhill, program expenses	16 07
S. G. Soverhill, program expenses	8 20
S G. Soverhill, program expenses	14 50
H. T. Thompson, plates and janitor	2 00
Total expenditures	$246 89
Balance on hand	92 01
	$338 90

On motion, the report was referred to an auditing committee appointed by the chair: Guy A. Bryant and George A. Hunt.

On motion of L. R. Bryant, a committee on membership was appointed, consisting of Messrs. Amos F. Moore, Charles Hey and L. H. Cutler.

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PRESIDENT'S ADDRESS.

W. R. SOVERHILL, TISKILWA.

Members of the Society and Friends:

As you know, the duties of President fell upon me through the resignation of your esteemed Mr. Thompson. Much might be said of the capable manner in which he conducted the duties of President of this Society, the interest at heart he had for topics relative to Horticulture and the success he achieved in fruit growing at Marengo.

Since the president's address has been dispensed with for the past few years, and as I am not a speaker, you may congratulate yourselves on being relieved from this formality.

But I wish to say that since the Executive Board met in your town I was impressed with the interest manifested in the matter. Since our last meeting at Polo we have met in many different sections of this Northern District, with the object of the advancement of the science of pomology and art of horticulture.

Many are here who have spent years of labor and thousands of dollars in horticultural work. They offer their experience and lessons for the mere asking the question.

I sincerely hope and believe that what is said and done during our stay here will be felt by the citizens of Polo and vicinity for a great many years. I hope that the good we may do will be felt throughout the State. I have great faith in fruit growing, and believe there is no place better adapted to the requirements to success of the undertaking than in that District known as Northern Illinois.

Make this your meeting, get acquainted with the speakers; we want your experience; we came to receive as well as give. I will not detain you. I thank you.

On motion of Mr. Hartwell, E. A. Richardson of Sparta, Wis., was made honorary member. Mr. Richardson thanked the Society

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for the honor conferred upon him and said: The delegate who preceded me informed me that your section through here was devoted largely to the raising of small fruit. That is the principal industry of the horticultural people in Sparta. Our Association this year marketed a little over 300 crates of strawberries, fifty crates of raspberries, and about the same of blackberries. Our fruits were all handled through our Association, and I would say that I am here to learn what I can and to impart what information I can and I am glad to be with you.

On motion of Mr. Hartwell, E. A. Riehl of Alton, Prof. J. W. Lloyd of the University of Illinois, and W. B. Lloyd of Kinmundy, Secretary of the State Society, were made honorary members.

At the invitation of the President, J. L. Hartwell, delegate to the American Pomological Society, gave a brief review of the meeting, stating that a full report would appear in the proceedings of the State Society.

MR. BRYANT—Was not the Society represented at the other district meetings this year, if so, are we not entitled to have a report from them?

THE CHAIRMAN—I was not appointed a delegate. I will say that the Southern meeting was held November 26 and 27 at Belleville. They had a very good attendance, their fruit display was quite meagre, perhaps between forty and fifty plates. They had a very good program, not as large an attendance as usual, perhaps on account of the off-year in fruit, it is pretty hard to get the fruit men out in a year when fruit is so much of a failure as it was this year. There are some wide awake horticulturists down there; I was only too glad to meet those people.

WEDNESDAY—AFTERNOON SESSION.

CARE OF AN ORCHARD.

WILLIAM SANFORD, POLO.

When asked to write a paper for this meeting it seemed to me that so much had been written and discussed in the fruit growing papers that it would be useless for me to add anything farther, but when insisted upon I consented to give what little experience I had had along this line.

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It has been estimated that scarcely more than ten per cent of the trees sold by nurserymen reach the bearing age; many times the method of handling the trees is the cause.

My experience in planting an orchard near here was this: In the first place the tree digger had been run under the trees a year before I got them; the main roots were covered with fiberous, or feeding roots, three or four inches long. When taken up in the nursery they were immediately packed in large shipping boxes and sent to my address. The ground selected was a gentle north slope; it was plowed and marked out both ways with sixteen-inch plow. The trees were tied in bundles of ten each. When ready to set, two bundles were placed in a half barrel of water, driven along as needed for setting. When taken from the water they were placed in the row and dirt packed firmly about them with the foot. In this method I set 780 trees without the loss of a single tree.

The first season's growth averaged from twelve to fourteen inches. In cultivating I plowed and harrowed each spring and with a five shovel cultivator close to trees kept them clean until time to sow buckwheat.

I think buckwheat one of the most profitable crops to grow in an orchard up to the bearing age; it does not take much strength from the ground and matures its crop in about two months. So the orchard is in clean condition about ten months of the year. It yields twenty bushels per acre and is usually worth one dollar per bushel. After trees are bearing well no plan equals clean surface cultivation.

When trees make only a yearly growth of six inches they should receive a dressing of stable manure.

Trimming I do in April and May, cutting out all limbs that grow toward the center of the tree and a part of the spurs where too thick, taking off limbs on about the same slant as the shoulder of the limb, close to the body of the tree. I use a very thin two-inch chisel on a long handle; for smaller limbs use a close cutting shears, with eighteen-inch handle.

I have not been able to raise really marketable fruit without spraying. Two sprayings are very successful for apple scab and codling moth; but curculo get in their work later. I think three or four more sprayings would very nearly shut them out.

I set out ten varieties; only four have been a success.

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I use a hand power spray pump with a duplex or double cylinder with twenty foot hose and a twelve foot bamboo pole; for a nozzle I use the spray motor. The best method of keeping apples is barreling and storing in a cool place.

DISCUSSION OF MR. SANFORD'S PAPER.

A MEMBER—Do you still cultivate your orchard?

MR. SANFORD—I am not cultivating, but I am not getting nearly the results that I did when I kept it in cultivation.

A MEMBER—How far apart do you put your trees?

MR. SANFORD—The trees are only twenty feet apart. I will never set an orchard again less than thirty-two. The Grimes Golden are doing very well, they have perhaps done about as well as if they were farther apart, but the Wolf River are crowded very much. The Wolf River, if I were to set them again, I would set about forty feet apart, they are very spreading and I find the spreading trees, with limbs that grow out, are the trees that bear the fruit. An upright tree does not bear. I keep everything spread as much as possible, the more spreading the better. Nearly all heavy bearing varieties have the habit of spreading.

MR. STODDARD—Do you raise the Northwestern Greening?

MR. SANFORD—I have some hundred trees, but they are not successful with me, half of them rot on the tree, the other half fall to the ground and they are very subject to scab.

MR. HARTWELL—What is your experience with the Milwaukee, how many trees have you?

MR. SANFORD—I have about 300, unhappily.

MR. HARTWELL—You are not satisfied with the Milwaukee?

MR. SANFORD—No, sir; they bear very well, but the apples are knotty, they just go into knots, not fit for the market. I get a few good cooking apples out of them, but they are very inferior.

MR. HARTWELL—I have been testifying for the Milwaukee on the basis of one or two trees that I have. I have had some of the handsomest apples I ever grew in my life from one or two trees, but my observation is that they are the favorite nesting place for all the pests on earth.

MR. SANFORD—They seem to be knotty and get very much out of shape.

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MR. HUNT—Will you name your most profitable varieties?

MR. SANFORD—The Wolf River, first in season, has been very profitable. They only bear every other year but are loaded down when they bear, and they are satisfactory; they stay on well and they outsell every other apple during the season. Some people say they do not like them, they are a big, coarse pumpkin, but at the same time they will buy them. Drive along the road with a load of Wealthy and I will take a load of Wolf River right behind and I will sell three bushels to one; they will come out with their dish-pans and get some of those big apples. I think the Wolf River ought to be taken off the tree and matured. When taken fresh off the trees, they are coarse; if taken off and kept a short time, they become tart, and they are good cooking apples. I think they are much better after they are matured two or three weeks or a month.

MR. HARTWELL—Do you not discount the intelligence of human nature when you find them taking Wolf River instead of Wealthy?

MR. SANFORD—I do not, when the Wolf River is matured. We have tried them on our table and we do not find anything better or that makes as nice an appearance on the table as the Wolf River. I sell them to grocers, they tell me the trade calls for the Wolf River, they say to me, "If you have any Wolf River, send them along, if you have not, we do not want any." They are desirable for canning; if taken before they are matured they will hold their shape in the can; after they have been held for three or four weeks, they will go to pieces in the can.

MR. SOVERHILL—What proportion of Wolf River will barrel as No. 1?

MR. SANFORD—I should say two-thirds No. 1 grade. There are some that grow on the inside of the lower limbs that do not get the color, they get little black specks, that cuts them out, but nearly all apples that grow up above are No. 1 quality.

MR. HARTWELL—Are you bothered with the rotting on the trees at all?

MR. SANFORD—Yes, a little with the Wolf River, but I think more spraying would shut that out. I have never sprayed them twice. I have fifty of them and barring this year, they produce about 200 to 250 bushels yearly, and they sell on the market. In years when apples were plenty as they were two years ago I have never sold them for less than sixty-five cents a bushel on the market; the Wealthy at the same time were selling at forty cents.

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If well sprayed, they stay on very well, some will stay on until the winter apples are being picked. They have a large stem and are pretty hard to pick, one must nearly break the limb to pick them.

MRS. HEY—Will you describe your spraying tanks?

MR. SANFORD—I use a half round tank with a tight cover over the top; I think it is about six feet long and three feet broad on the top. It holds four barrels, or 200 gallons, practically as large as can be managed by two horses. The agitator is a six-inch board that is hinged and works up and down with a pump lever.

MR. HARTWELL—Does it come as part of the machine, or do you put it in yourself?

MR. SANFORD—Either way. You can put it in yourself. I ordered mine set up at the factory complete.

A MEMBER—Do you think that would be large enough to spray 2,000 trees?

MR. SANFORD—When it comes to 2,000 trees, I think a power sprayer would be preferable. The pump is strong enough, there is no doubt about that, but I think if you have as many trees as that, it is pretty hard to pump by hand.

A MEMBER—After you quit raising buckwheat, do you put in a cover crop?

MR. SANFORD—After I quit raising the buckwheat, I made an effort to seed down to red clover, but only got a partial stand of clover; I did not have time to do the cultivating. In the first place I made up my mind that my trees were growing pretty fast, and it did not seem to me they were coming into bearing as soon as they ought to, and I thought leaving off the cultivation would check the growing and they would come into bearing. They were growing like a stalk of green corn, they seemed to be growing and keeping at it. Whatever clover grew up I mowed with the mower, and left the mulch on the ground. That worked very nicely for three or four years, it kept almost everything else out and it kept a mulch on the ground during the dry period. After about two years, little bunches of blue grass came in, little hills here and there, and for the last two years they were just about united. Well, I plowed this orchard up and practiced clean cultivation for a couple of years. I had very good success with manuring trees that were not bearing and also trees that were bearing an inferior quality, knotty and small; giving a little dressing of stable manure would make them bear the very finest fruit.

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MR. HEY—Did you ever pasture any hogs in your orchard?

MR. SANFORD—No, I purpose doing that. I believe from my experience and what I have noticed where hogs run in the orchard, that it is all right to do so. I do not believe it is wise to shut them up, but having an orchard open during the season when the young apples are falling, let the hogs run through and pick up the apples that have curculio stings and codling moth stings. I think that would be a great advantage.

MR. HEY—Do you object to sowing millet as a cover crop?

MR. SANFORD—I think millet would be a very good thing, but it seems to me that it would exhaust the soil and dry the soil.

MR. HEY—I sowed millet in my orchard this year about the 15th of August, and it froze as soon as the frost came and turned white. It is the whitest kind of straw now.

MR. HARTWELL—What have you sprayed with this year?

MR. SANFORD—I use the Bordeaux mixture, four pounds of blue vitriol, four pounds of lime and four ounces of Paris green.

MR. HARTWELL—Does your Bordeaux mixture control the scurvy bark louse?

MR. SANFORD—No, I think it has no effect on the scurvy bark louse; I think nothing but the lime and sulphur mixture will have.

MR. HARTWELL—I had that louse on my place and as soon as I sprayed the dormant trees with the lime and sulphur it disappeared. I want to say what the standard remedy is for scurvy bark louse, it is not lime and sulphur, it is the kerosene emulsion in June. Strike it at the breeding season. About the middle of June is the time the insect is hatched out.

MR. SANFORD—Of course the kerosene emulsion would be very much better; that would be the real thing, provided you can cover the trees properly at that time of the year with the dense foliage on it.

A MEMBER—Did you ever have a windbreak?

MR. SANFORD—No, I do not believe in windbreaks. I would rather have the tree out in the air. I think we do not need windbreaks unless it be to keep the apples from blowing off. For the health of the tree, I think we need all the sun we can get.

MR. HARTWELL—Would you recommend the Garfield for the farmer or commercial orchardist?

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MR. SANFORD—For a cooking apple, there is no apple I have had on the market that gives the satisfaction that the Garfield does. It is a very good bearer and bears regularly, bears every year, I have a good crop every year and they give the best satisfaction.

A motion by Mr. Hartwell that a special committee be appointed to draft resolutions in memory of Arthur Bryant who died last May, was carried, and the chairman appointed as such committee Messrs. J. L. Hartwell, E. A. Riehl and S. G. Soverhill.

A motion by L. R. Bryant that a similar committee be appointed in recognition of the death of Edgar Sanders of Chicago was carried and the chairman appointed Messrs. L. R. Bryant and J. L. More to serve on this committee.

WHAT CAN A WOMAN DO IN HORTICULTURE?

MRS. EMMA HEY, DIXON.

What can a *woman* do? This is a question which I have no doubt women have been asking themselves ever since time began, and the time was when she must have said, "What *can* a woman do?" with such a feeling of helpless, hopeless dspair as no woman of energy and intelligence need ever feel today. The time was, and not so long ago either, when no declaration of independence had ever been thought of for woman.

Leaving the women of other lands entirely out of the question and looking only at our own country, the historian tells us that during the colonial days it cannot be said that women constituted an economic factor, as no occupation but domestic service was open to them.

Harriet Martineau relates that in 1840 she found but seven employments open to women in the United States. They were: teaching, needlework, keeping boarders, working in cotton mills, type-setting, working in book binderies and household service. Now there is hardly a single field in which women are not employed and the iron which entered the soul of countless dependent women of that day seems as far removed from us today as the thumb screws of the inquisition.

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New opportunities bring new responsibilities and now that all doors stand ajar for her the responsibility of choosing is also hers.

Woman's natural place is home. That is where every womanly woman delights to be. Not in store or mill or office is her pleasure found. Compulsion or a false pride send her there.

"Women Horticulturists" has a pleasant sound to those who are familiar with the possibilities in this direction, but the devotee of society shudders as she thinks of toil in the fields. She calls to mind the tales she has read of the women laborers in the cotton fields of the South; visions of women workers in the vineyards on the Rhine flash before her mental vision and she recoils from the thought and so the women who have the brains and the brawn to enter upon this line of endeavor are comparatively few. I am not here to say that there is not much hard work about it for which men would have to be employed, but why may not woman use her brains in this direction, supplying physical deficiency from her mental resources? Why should we foolishly hesitate in a choice between methods of obtaining a livelihood when in horticulture are independence and health and in the shop sickness and starvation wages?

If woman in choosing an occupation would always choose one congenial to her nature, to her desires, and the tendency of which is to inspire, encourage and develop her along the lines of her own being, many a woman would find that along horticultural lines there was a great field open to her in which she would find ample opportunity for the use of all the energy, skill, intelligence and good judgment of which she may be the possessor, with the positive assurance that she would receive ample reward for her labor.

Since woman is the home-maker by nature, whatever comes nearest to the home life in its nature, would be the best calculated for her, and it seems to me there is no branch of horticulture which she might not undertake with just as much assurance of ultimate success as a man would have, provided she be the right sort of a woman. In any line of this work of which I know anything there is much that even a delicate woman might do much to her physical well being, for the commercial side of horticulture, as an occupation for women is no more important than the benefit gained by the bracing effect of this employment upon the health as a nerve tonic; the continued and not over-fatiging exercise in the open air has no equal in the long list of patent medicines. As a business for women it is already an accomplished fact and its doors are open for thousands more.

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Women have been and are today successful florists. There is an ever increasing demand for cut-flowers and who shall say that there is any limit to the possibilities along this line.

A lady in Wisconsin has done a flower seed business for many years. Many women grow strawberries for market and find from the sale of them sufficient revenue for their support and the education of their children.

For fear there might be some doubting Thomas in this audience, whose acquaintance with women has been chiefly among those who are always taking the "rest cure" for their ailments, I wish to tell of two New Jersey girls. They own a twelve-acre farm in New Jersey and travel back and forth to New York City to business every day. They care for five hundred pigeons, fifty chickens, a cow and a horse and also raise Collie dogs. They arise at 4:30 every morning and leave for business at 7 a. m., driving two and one-half miles to the station. In addition to all this they set out one acre of strawberries last spring, which they, with the help of a boy, have cared for this summer. I recently saw a picture of that acre of strawberries and I assure you it would put the bed of many a man to shame. These two girls expect as soon as maybe to have their entire twelve acres in strawberries.

Women are as much interested in the products of horticulture as men. If they are not interested in the business they should be. We are most interested in what we work for. Therefore if you are not interested work up an interest. It will bring you out into the glorious sunlight and the fresh air will bring roses to your cheeks and add pleasure to your life.

Many women though not the actual bread-winners have taken advantage of their opportunities to take over some part of the work and thereby earn some pin money. One woman has charge of the hot beds and sells all surplus plants. She sells tomators, sweet potatoes, peppers, celery and egg plants.

Two girls make a neat sum every spring from the sale of pansy plants in small pots. These plants are grown out of doors in autumn, protected during winter and in the spring potted and sold.

One lady told me that last season she realized $200 from the sale of peony buds.

In some sections of the east it has always been the province of the women to care for the kitchen garden. If they can grow vegetables for the home, why not for the market?

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There is another phase of this question, not a commercial one at all, which it seems to me should appeal to every home-maker. She should use it as a means to beautify and elevate her home and educate her children.

Ruskin says, "What we like determines what we are, and is a sign of what we are, and to teach taste is inevitably to form character." If this is true, and who can doubt it? then if we educate a child to love a flower, or to care for a tree we have helped to lay the foundation of character, for it is in helping nature that the child feels the influence which makes for his greatest good.

Some one has said that an intense love of nature is a sixth sense. We are not born with it nor do we often acquire it in later life. It comes through our rearing, then that childhood is defrauded of most of its inheritance and is denied a great source of pleasure if no one leads him into the ever recurring miracle, mystery and beauty of growth. Those who love nature can never be dull, provided that love be expressed by an intelligent interest, rather than by a purely sentimental rapture.

In the rough and tumble of life the grosser elements of our nature are constantly developed. Selfishness is a ruling element of human character. If there were no refining influences, no aesthetic influences, we might degenerate and once more become barbarians. When you introduce flowers into the home circle you have introduced an elevating and refining influence which cannot fail to leave its work on the soul of your child throughout all eternity. Then let the boy or the girl have a garden. Let them grow what they will interfering only enough to see that they get results. Be a horticulturist yourself and then teach your child to be one.

As I look at it every woman who wishes to make the most of her opportunities in life, should grow flowers and have a large interest in the vegetable garden. It matters not whether she lives in God's glorious country, where there is practically no limit to what she may grow, whether her domain is limited to a town lot, or even if she lives in the crowded city, where she can only have room for a window box with a plant or two inside and a piece of a wee tucked up back yard, still she may add joy and zest to life by planting and caring for a few growing plants.

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The chairman appointed the following committees:

Judges on Fruit, Classes 1 and 2, E. A. Riehl; Class 3, Mrs. Amos F. Moore; Class 4, Prof. J. W. Lloyd.

On Revision of Fruit List for Northern Illinois, S. H. Soverhill and H. G. Street.

A PLEA FOR QUALITY IN FRUIT.

E. A. RIEHL, ALTON.

The time was when any kind of fruit would sell at good prices if it only looked well. It was natural, therefore, for fruit growers to pay more attention to productiveness and hardiness than to quality. But now conditions are changed, there is more fruit produced than ever before and there will be more in the future. Transportation facilities are also being so improved and our knowledge of the conditions necessary to success in the shipping of fruits so well understood that we are coming in competition with the whole world. Apples have been shipped from Australia to Europe and to this country as well. Consumers are also becoming educated in the matter of the quality of fruit and more discriminating.

There is a saying that we should eat to live, not live to eat. There is much of truth in this in a way. Still it is true that we all prefer to have what we eat of good quality, and I believe it is right for us to enjoy what we eat, otherwise the sense of taste would not have been given us. Whether I am right or not in this belief, it is a fact that all persons prefer food that is palatable, and in nothing is this more true than in the matter of fruit. I am firmly convinced that were growers to produce and put on the market only fruit of the best quality there would be a greater demand and that prices would be better. When a consumer procures a package of fruit and it is of poor quality it will be a long time being used up, and when gone there is little desire for more and it will be some time before more is purchased. On the other hand, if the fruit is of the best quality, every one enjoys it and it is soon gone and there is a strong desire for more, so that more will be procured with little delay. Nor is this all, fruits of the best quality will command better prices than that which is inferior. There are those who will dispute this and will cite you the quotations of the market reports, which give the price of Ben Davis apples as within a few cents of what other varieties of better quality like Jonathan, Grimes, McIntosh and others of like good quality are quoted at.

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Such persons may not know that fruits of the highest quality are not quoted in the price lists sent out. But those who are posted in such matters know that such is the case. I was at one time in a Chicago commission house, asking the price of some Jonathans, and was told they were bringing $8.00 per barrel, expressing my surprise in a manner that was understood as doubt, Mr. Newhall called to one of the salesmen and asked what they were selling the Jonathan at. He replied, "$8.00 to the trade and $10.00 to clubs." This was at a time when the best quotations were $3.00 to $3.25 per barrel. I could cite numerous such instances, but think it unnecessary. The best proof of my claim is the history of the fruit business of Oregon. There the growers have combined to grow apples like Spitzenburg, Newtown, Delicious and others of like high table quality. They also grade and pack their fruit in the very best manner possible. No grower is allowed to pack his own fruit, but this work is all done by experienced and disinterested persons who make this their business. The result is that they have, and are receiving, prices for their fruit that if it had been told a few years ago as possible, would have cast doubt on the sanity of the speaker. As an example I wish to say that I have it from a reliable party who got the facts on the ground that the Hood River crop was sold this season to the highest bidder, by sealed bids being received from intending purchasers from all the large cities of this country and some from Europe. The prices offered for the whole Hood River crop ranged from $1.50 to $3.27 per box. Some may say that these prices are paid because of the perfection of the fruit, fine color and its freedom from insect injury. That no doubt had something to do with it; but it is nevertheless true that they do grow almost exclusively varieties of the best table quality and do not get the same high prices for inferior varieties. It should be remembered that there are a great many persons now who have the means and are willing to pay almost any price for articles that please them.

Living in the southern part of the State, I may not be a good judge, still I must say that it has often seemed to me on reading your proceedings that you made altogether too much of hardiness and thereby lost sight of quality. Which I believe is a great mistake at this time. I believe that more money is to be made by growing only fruits of the best quality. Nor is this all. I believe we get much of the enjoyment of life while engaged in our daily work. The housewife gets a large part of her pleasure in life from the work she does and the pleasure it gives to those dearest to her—her friends and acquaintances. So, too, we fruit growers should find much of life's pleasure in the satisfaction our work brings to

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others and the appreciation that our customers show. It is a great pleasure to be told by customers that what you sold them was of such good quality that they want more and will never buy elsewhere as long as you can fill their orders.

Discussion of Mr. Riehl's Paper.

Mr. Hartwell—There was on the program of the Pomological meeting a gentleman from Oregon whose duty it was to tell us of the working of the Oregon laws, and of the results of their packing systems and what Mr. Riehl has said is quite mild compared to what he told us. The fact is they almost exclude from the State objectionable varieties in quality. They have the law factor of it down to a very fine point. Everything is inspected. What he says is true there, that no man is allowed to pack his own fruit; it is all done by the organization, and the common price for apples, putting it on a barrel basis, is $9.70 a barrel. Now they get these results not only by getting what we call "quality" varieties, but I take it that Mr. Riehl has the right to introduce the question of spraying to produce quality. I think an apple that has not any worms in it is a much better quality than one of the same variety that has. I think an apple that is grown healthy, is not scabby, is not knotty, is of better quality than one that is the other way. The best of their apples come from the field with almost absolute perfection. In this connection I would like to refer to what is known as the Canada Fruit Marks Act, which I have somewhat elaborated in my report for the volume, and I think it is worth your while to look up my statement there. I simply give a review of what was presented by Mr. McNeil regarding the Canada Fruit Marks Act, which originated somewhere along in 1900 and it has had these seven years to work out. The Canada Fruit Marks Act demands inspection by officials of all apples that go onto the market. Every man must mark his fruit according to its grade and he is severely dealt with if he does not do that. The result of it is that the prices of fruit have increased, that the quality of fruit has improved and no honest man who wants a square deal in Canada is opposing the Canada Fruit Marks Act today. The convention of pomologists at this meeting unanimously voted that a committee should be appointed to co-operate with the Department at Washington to secure national legislation along the lines of the Canada Fruit Marks Act, and our Society and every other Horticultural Society of every State are invited to co-operate with this movement and I would refer this matter to the resolutions committee in drafting resolutions for this meeting.

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THE CHAIRMAN—I understood one point in Mr. Riehl's paper was that he attacked hardiness in the selection of varieties.

MR. RIEHL—I have no objection if you people keep in mind hardiness, that is all right; I would probably do the same if I were here, although with us it cuts no figure, but I think you have run it to extremes and have left out something that I think of perhaps a little more importance.

MR. BRYANT—I want to ask a question in regard to the Oregon and Washington fruit; is it of high quality as regards flavor?

MR. RIEHL—I can say that it is, because I have eaten it.

MR. BRYANT—It is irrigated fruit, is it not?

MR. RIEHL—Not all of it, some of it is. The Colorado fruit is not good, what I have seen of it, but the Oregon fruit is of fine quality.

MR. STREET—It seems to me that it is getting so that we can change our lists a little for Northern Illinois so we would have fruit that is good for eating and cooking, like the Salome and the Jonathan and Grimes Golden that are good for eating but not so much for cooking. I think we are getting varieties that have the hardiness and also the flavor, and possibly we can leave out some of the other varieties that we have listed for hardiness.

MR. HUNT—I had quite a good chance to notice the difference in the quality of fruit from the different States while I was at the World's Fair at St. Louis, and I noticed that the Oregon apples were way above every other exhibit that was there. The Washington fruits, I think, were next, but if a person has never eaten an Oregon apple, they simply do not know what superb quality in apples is; they were the finest flavored apples I ever tasted in my life. You cannot raise them here with the same quality and flavor.

MR. STREET—I would like to ask where the Smith Cider apple is grown, whether it is an Eastern apple. I ate some that came from Chicago and as an eating apple it was extra good.

THE CHAIRMAN—My opinion of it is that it is a Southern apple. Can you tell us about that, Mr. Riehl?

MR. RIEHL—Smith Cider was originated in Pennsylvania. But the matter of quality is a matter of taste. I think Mr. Street likes acid apples. It is grown in the South, but it is not planted much anywhere now. The objection to it is that it blights somewhat and the trees break very badly. The wood is brittle.

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MR. HUNT—While we are on this subject of quality in fruit, I would like to ask if there are any fruit growers here that grow the Spitzenberg? I am very partial to the Spitzenberg and I would like to know whether it is successfully grown here in Northern Illinois.

MR. SOVERHILL—I have tried it at two different times. It will grow and produce a few crops, then it will die down. It is not adapted to this soil and climate. As Mr. Street says, the quality is fine. I do not know whether it is correct or not, but I have understood that the Salome apple was a cross of the Spitzenberg, if you will notice the color, you will see that the apple resembles it very much. This gentleman spoke about the tree breaking down. That is one great thing in favor of the Salome apple, you can scarcely break it, the limbs will almost lie on the ground and you scarcely ever see one broken. It is one of the hardiest, healthiest, best growing trees that we have in Northern Illinois.

MR. HARTWELL—I want to say this about the Snow apple, I see it selling on the Dixon market at seventy cents a peck, and dealers tell me it is going rapidly. It was spoken of at the Pomological meeting as having originated in Canada. They have a large family of apples all of Snow origin in Canada, that they consider promising and I believe they would be of much help to Northern Illinois, inasmuch as we probably have no hardier tree than the Snow in Northern Illinois. The McIntosh Red is one of the types of the Snow and several others that I cannot recall now.

THE CHAIRMAN—I would like to ask Mr. Hunt if he noticed any McIntosh Red in the Western districts?

MR. HUNT—No, sir; I did not.

THE CHAIRMAN—I have seen them advertised a great deal in the last few months, the McIntosh Red apple.

MR. HARTWELL—This man said the nurserymen of Canada could not begin to supply the demand for the McIntosh tree.

MR. SOVERHILL—I will speak a good word for it, it is a good apple, a good, hardy tree, good grower, good producer.

THE CHAIRMAN—Does any one know where the tree can be obtained?

MR. HARTWELL—All the Canada people grow it.

MR. SOVERHILL—I know that it was grown in Geneva, New York, that is where mine came from.

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MR. RIEHL—The first I learned of the McIntosh was in the West Virginia display at the St. Louis Fair. They had a great many there.

MR. HUNT—There was quite a large exhibit of McIntosh in the Illinois exhibit of fruits.

REPORT OF EXPERIMENT STATIONS.

W. R. SOVERHILL, TISKILWA.

The fruit crop being limited this year, this report necessarily will be quite meager. All horticultural stock has made an excellent growth this season and fruit buds set abundantly for a crop in 1908.

The warm weather in March, followed by frosts and freezing weather all through May, curtailed all tree fruits, while the berries made a fair crop.

At Station No. 1, at Princeton, the only apple tree that bore fruit was Salome.

The Keiffer pear bore a few specimens.

At Station No. 16 the Lincoln pear does not seem to blight; bore some fruit this year, and is a promising pear.

At Station No. 18 the Lombard, Wolf and Wyant plums matured a fair crop, with all the adverse conditions.

Perfection and *Wilder* currants have established a place among recommended fruits.

Blower Blackberry came through last winter in good shape. Its recumbent or creeping habit indicates that it is perhaps a half dewberry and half blackberry. Fruit large, long, good flavor.

King Raspberry promises good.

Plum Farmer (Black Cap) extra strong grower; bore good crop; no sign of disease; very promising.

Iowa (Red) gives promise of value; berry large.

Report made of grapes September 10. Those reported:

Vincennes (Red).

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Brilliant.

Wyoming (Red)—Bunch medium in size, compact, being smaller than *Woodruffs* red, nearly ripe; healthy, vigorous grower; promising.

Early Ohio (Black).

Prentiss Red.

Green's Early—White; prolific; under size; foliage good; very early.

Moore's Diamond (White).

Green Mountain (White).

Eaton (Black)—Next in size to McPike; not prolific.

Ives Seedling.

Eclipse (Riehl No. 10) Black.

Riehl No. 15.

King—Black, berry large, good bunches for first season bearing; foliage good; vigorous vine.

Station 16 reports fairly favorable season for strawberries, a little too much moisture during fruiting season. A little damage from frost at blooming time.

A variety to receive recommendation must prove as good or better than Dunlap. Splendid, or Warfield, or it may look promising this season and fall back next.

Of the twenty-five varieties reported this year, those attracting attention are as follows:

Abingdon—Fairly productive, strong plant; sets large bunches of large, oblong berries; berry stems prostrate; ripens early; light red; good flavor; sort rust; staminate.

Florella—Similar in shape, size and color to Abingdon; better foliage; fruit stems fairly erect; no rust; season medium, firm, promising.

Notes taken September 10:

Pan-American—Each plant produced five to eight fruit stalks, only one set plants; have picked ripe fruit for several days. There are many blossoms just opened and many to open.

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Autumn—Similar to Pan-American in bearing qualities. Not quite so prolific in fruit, but more in plants.

Ekey—Large, conical; good flavor; firm; some rust; otherwise good foliage; good shipper; color dark; ripens early.

Cardinal—Good foliage; large round, slightly conical; dark; firm; promising.

Hummer—Strong, vigorous plant; leathery foliage; very productive; regular in shape; large; fair flavor. Would be popular market berry.

The New Home, so thoroughly advertised, is a complete failure in the district. Fruit growers, beware of these horticultural products that are so attractive through advertising mediums; watch for their report after being planted in any of the several Experiment Stations in the State.

Any volume of the State's transactions will save you many dollars if it is in sight when the tree agent calls on you. Buy but the established varieties recommended for your locality.

I will make mention here of the *Ridgely* chestnut at Station 1. Bears three years after planting; annual bearer and good yielder. Their planting should be encouraged.

Discussion.

Mr. Hartwell—I would like to have Mr. Riehl give his testimony as to his present estimate of his No. 10, the Eclipse. It is an early black grape with me, ripens not far from the same time as the Moore's Early, I think a little later, and it is smaller than Moore's Early, and therefore not of the same market value, but the quality is very fine.

Mr. Riehl—I am not here to advertise anything that I may have had anything to do with. The Eclipse is a grape that I originated, grown from the seed of Niagara. I have grown a great many seedlings and they are of all colors, white and red and brown and black. This is the only one that I think is good enough to merit a name and be disseminated. I do not know what it will do elsewhere, but with me it is the earliest grape and the best early grape that I have ever fruited. It is of fine quality, which you cannot say of any other early grape and it is earlier than any other; it is earlier than Moore's and earlier than Headlight. It has some of the characteristics of the Niagara and by the way, Niagara I consider the best grape in our part of the country; no other grape

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excepted of any color. If I were restricted to one of the old grapes, I would take Niagara. It has the quality of hanging onto the vines for weeks and months, you may say, after it is ripe, and it does not make any difference how much rain we have, it will not crack. The Eclipse has that same quality, it will hang for a long time after it is ripe and it does not go to pieces, no matter what the weather.

MR. HARTWELL—Here is an illustration of how one man cannot talk for another. I could have made this same speech for the Niagara three years ago, for Northern Illinois, but I have got to take it back, Niagara has killed to the ground for me for the last two or three years, so what Mr. Riehl has said is true for Alton, is not true for Northern Illinois. Its quality and productiveness are fine, but it would not stand our Northern climate under ordinary conditions.

MR. RIEHL—I believe that is true, because in exceptional seasons the Niagara has suffered from the cold, but with us the cold, cuts such a small figure that we do not consider it, but for other practical uses and quality I think Niagara is at the head of everything in the old grapes.

MR. HARTWELL—There is something peculiar about that hardiness question that I do not understand. I have had the Niagara pass through hard winters without protection and then have had it killed to the ground in ordinary winters. There is something in the atmospheric conditions, or the peculiar condition of the atmosphere or soil, either too much moisture or too little, or something of that kind, that causes things to die from the cold, possibly when it is not very cold, and to pass through an extraordinary cold winter without any damage. We cannot draw conclusions that are based on insufficient data.

MR. BRYANT—Do I understand then that you would cease recommending the Niagara?

MR. HARTWELL—Not at all, but I want to tie a string to it when I recommend it.

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QUESTION BOX.

JACOB FRIEND IN CHARGE.

QUESTION—Would it not be a good idea to keep apples in a tin or galvanized box, air-tight, for family use?

MR. HARTWELL—I think metal boxes are not good preservers for fruit.

MR. BRYANT—I should think any metal receptacle would be very objectionable while there are any changes in the temperature, because it would be so good a conductor. I remember some gentlemen proposed a sheet iron barrel a few years ago as being cheaper, but I think it would be very objectionable for handling apples merely on that account.

QUESTION—Is not the quality of the Oregon apple due to its remoteness from the market?

MR. RIEHL—If the gentleman thinks that, and he grows apples, I would recommend that he send his apples to Oregon and see how he pans out.

MR. FRIEND—There is a lot more in the question than we are willing to recognize. I think remoteness has a great deal to do with it. I am not questioning the quality of the Oregon apple. I do not believe that the apples that we grow at the present day in Northern Illinois have the same quality that the very same apples had years ago when we used to grow them. I do not believe they are as good. Apples like the Dominie, the Wine Sap and the Rall's Janet and all those apples are not nearly in size, in color or in quality what they used to be. You can get just as much sport out of this as you wish, I do not blame you, but I know whereof I speak when I say that the apples on our tables at the Northern, Central, Southern or State meetings do not compare with the varieties that were produced in this country when it was new. Before the advent of injurious insects and enemies of the tree it seemed that we produced a better quality of apples and larger and better apples than we are producing now. There may be something in the fact that Oregon, being a new country, is producing now a perfect apple as we produced a perfect apple when this country was new. There may be something in it, it may not all be a laughing matter.

MR. HARTWELL—They have to spray in Oregon. It is not so new there but what they have insects.

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MR. FRIEND—In the Ozark regions I understand, in the remoter parts of the Southwest, that they are just beginning spraying operations now on account of the insects.

MR. HARTWELL—I saw 800 acres of apples in the Ozark that were full of worms.

QUESTION—Is the crop failure this year likely to diminish insect pests the coming year?

VOICES—Yes, yes.

MR. SOVERHILL—There are a good many "yeses" to that. There must be something in it.

MR. HARTWELL—The codling moth cannot hang over unless he has something to hang over on. He came right along with the apple.

QUESTION—What is a good red raspberry for this section?

MR. STREET—The Early King.

MR. HEY—Not for me; I have tried the King and it is worthless, the most worthless I have tried.

GUY A. BRYANT—With us at Princeton, the King is the best red raspberry we have ever had.

MR. HARTWELL—I got the plants from you, and they are of no account, for me, I say. There is no contradiction of what you said at all.

MR. RIEHL—I was just going to make the remark that there were spurious Kings and in saying whether they are good or bad it is well to bear that in mind. Not all raspberry plants sent out as King are the real thing. With me the King is a good one.

MR. LLOYD—Here are two men within a few miles of this town that say it is good for nothing.

MR. STREET—Mine were given me by Prof. Green of Minnesota and of course they were put on new land where there was no root gall or anything like that, and I have had them in the same place for seven years; no sign of root gall, and the fruit is good. They are on the principle of the Marlborough.

GUY A. BRYANT—Since I made the report on the King and since Mr. Hartwell made his report, it is well to bear in mind that his plants are on clay soil, ours are on black prairie soil. That makes a difference.

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THE CHAIRMAN—May I ask Mr. Bryant what about the Ruby Red?

MR. BRYANT—We have the Ruby Red, but it is rather an indifferent berry; that would be my report on it. It is a pretty good size, but with us it has not fruited very heavily.

THE CHAIRMAN—Is this King the suckering sort?

GUY A. BRYANT—Yes, true red raspberry, the suckering sort.

MR. HUNT—I think the explanation Mr. Bryant gives in regard to the difference of the soil would hold true. As I understand, this King is quite a little like the Marlborough, and the Marlborough has been the best we have raised on our soil. On a light soil it is of no account at all, so I think probably the difference in the variety is due to the difference in the soil.

MR. HARTWELL—That ought to be emphasized in the beginning. We must not condemn a variety because it has failed in one locality or embrace it because it has succeeded in another.

THE CHAIRMAN—The gentleman can draw this conclusion, if he has black soil the King will do well.

MR. HUNT—Yes, if he has the King or Marlborough on black soil he will get good results, but on clay soil I think there is nothing better than the old Cuthbert.

QUESTION—What is a good leguminous plant for cover crop in orchard to sow in July or August and plow next spring, one where the seed can be obtained for a reasonable price?

MR. HEY—I think the Clay cow pea, I think it was the Clay, that I sowed this fall, and it grew well. I got the seed from St. Louis.

MR. BRYANT—How about the cost of the seed?

MR. HEY—It seems to me it was $2.50 a bushel, if I remember rightly. I think I sowed three pecks to the acre.

MR. HARTWELL—Vetch could be recommended, but it costs too much; it costs $9 a bushel.

The Chairman appointed as a committee on final resolutions Messrs. George A. Hunt and L. H. Cutler.

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WEDNESDAY—EVENING SESSION.

Piano duet, Belle Clothier, Alice Talbot.

Invocation, Dr. J. H. More.

HORTICULTURE AND ITS REWARDS.

MRS. EMMA HEY, DIXON.

Horticulture is a development of civilization and concentration of population into cities and, comparatively speaking, as a business with us, is still in its infancy.

A hundred years ago commercial horticulture was unknown in the United States. While its growth has been rapid, it can hardly be said to have kept pace with the growth of our large cities for it is said they are often unable to get needed supplies of fruit and flowers.

Our governmental authorities have never seen fit to give us any very complete data concerning the relative importance of the several fruits and vegetables grown. Still there are some interesting figures available, for instance, from report of 1899 we learn that the combined horticultural products; this includes fruit, nursery stock, vegetables and flowers, amounted to over $500,000,000, or over one-sixth of all crops raised that year. From a letter written in February, 1906, by L. C. Corbett, horticulturist of the agricultural department at Washington, D. C., we glean the following: He says: "From the latest figures available at this office the apple has a commercial value annually of about $60,000,000, the strawberry $15,000,000, the grape $14,000,000, while peaches and nectarines reach between seven and eight millions. Total number of acres of strawberries last year 151,373. This seems to be a pretty good showing for fruit, but as long as the supply does not equal the demand the horticulturist may be reasonably assured that one of the rewards of horticulture, if the grower will see to it that the products are of the character required, will be that it will be at least remunerative, if not lucrative.

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I take it that this audience requires no introduction to the fruits and vegetables commonly grown among us. I feel sure that nearly every farmer in this vicinity grows apples, grapes, raspberries, blackberries, gooseberries, currants and strawberries. They each have a good sized vegetable garden in which all the old standbys are grown, and they know that the land devoted to these things pays them far greater returns than any other equal amount of land in any other crop, on their farms, pays them in money because these things lessen doctor and grocery bills; pays them in health because a fruit and vegetable diet is conducive to good health. It pays them according to its quality, in pleasure, pride and comfort.

There are some comparatively new vegetables which I believe are not so commonly grown among us as they should be, which it might be well to mention: Okra is a southern vegetable very much used there, but not very much grown here. We take the tender green pods, cut them crosswise, fry in a little butter and then mix with scrambled eggs or fold into an omelette. Cooked in this way they are very delicious. Pepper grass or upland cress makes a very pleasant addition to almost any salad. The German kohlrabi is much better than the turnip and is cooked in the same ways as turnip. Swiss chard will furnish material for greens all the summer through, and if you like a little acid taste in your greens grow a bit of sorrel and you have it.

Nothing is easier than growing your own spear mint and tarrogan, which will give such pleasing variety to your daily salad. Endive will give a nice crisp salad in winter when lettuce is gone. Salsify or vegetable oyster, will give you oyster stew, escalloped oyster or plain fried oyster, which, if rightly prepared, would deceive the very elect and be much more wholesome than the real oyster. These are all immediate rewards of horticulture.

And it is not so much of these of which I wished to speak as of the possibility of using horticulture for the satisfying of our esthetic nature, and the part is has to play in improving life, in raising not only fruits and vegetables and flowers, but in raising healthy men and women.

It has been said horticulture is the refinement of agriculture and a willing guide for its possible regeneration. Agriculturists and their wives cannot afford to be so absorbed in the methods of getting a living that they can devote no time to the enjoyment of living, or to be so practical that they can find no time to do the things which make the home attractive. If in the past you have been unwise in this respect, let me point you to horticulture as a

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VIEW OF FARMER'S GARDEN, UNIVERSITY OF ILLINOIS.

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willing guide for your regeneration. In the growing of fruits and flowers you will discover a new world, a world full of splendid possibilities and rewards—rewards both in satisfaction and in cash. To one who has felt its charms, the growing of these things is quite irresistable, and there is genuine rest, after coming from the field, tired and soiled, to take a bath, change attire and work among the flowers, trees and vegetables about the house, and a small amount of effort in this direction will add so much to making your home beautiful, your life livable or your farm salable.

Plant vines to the porches. They need not rot the wood. Keep that painted and fasten the vines to wire netting. You can have your choice among many at little cost; and in some cases no cash outlay whatever. Wild grape, American ivy, bitter sweet or virgin's bower can be had for the getting in any of our woods. Then there are wisteria, trumpet vine, honeysuckle in variety, matrimony vine, clematis paniculata, and jackmanni, Dutchman's pipe and the climbing roses. Perhaps the best of these are Prairie Queen, gem prairie, crimson rambler and Dorothy Perkins. These are all hardy in Northern Illinois. The wistarias and clematis need protection for a few years until well established, when they will take care of themselves. The roses should be laid down every winter and covered. You will get more roses if they are.

Do you think this a long list from which to choose? We chose to have all that I have mentioned at our home, but they are not all on the house. We have vines on fences, barns and all outbuildings.

There should be a good, closely mown lawn immediately about the house. Clumps of shrubs at the corners of the house, close up against the stone wall, add much to its attractiveness. Trees should be dotted here and there for shade and ornament, either as single specimens or in clumps, never in straight lines, except along the roadside. Here again you have many native trees from which to make selection and these in most cases will prove more satisfactory than the foreigners.

In evergreens we have spruces, pines, firs, cedars and hemlocks, and in deciduous trees even a longer list. There are maples, birches, elms, ashes, oaks, basswoods, poplars and many others.

Somewhere, either at the rear of the house or preferably at the side, have a shrub border. I will mention only those shrubs which we know to be hardy. There are lilacs, we have five varieties; spiraeas, of these eight varieties; barberries, three varieties; mock orange, two varieties; bush honeysuckles, three varieties;

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viburnums, hydrangeas and rosa rugosas. I wish to make special mention of forsythia; this blooms in spring before its leaves come out. It is the earliest of all the blooming shrubs. Last spring its wreaths of yellow bells hung on for three weeks, when it froze ice nearly every night.

We have some Hybrid perpetual roses, but unless one can give them pretty good care they are not very satisfactory. A florist's magazine recently made the statement that rosa rugosa is the only rose bush fit to be placed on a lawn. It is fragrant, blooms throughout the summer, and its beautiful foliage is never attacked by slug, rust, or mildew. It is to be had in pink or white, either single or double.

Dotted among the shrubs here and there one can have peonies, phloxes, daisies, gaillardias, delphiniums, iris, yuccas, bleeding heart, holly hock, gypsophila and many others. These are all flowers for busy folks, because they require but little care. The most they ask is not to be choked by blue grass.

Bulbs and annuals require more care and labor, but they add their touch of brightness to the scene. We have tulips, cannas, dahlias, gladiolus, pansies, salvias, asters, zinnias, phloxes and others.

These things add to the home a value which cannot be measured by a bank account, but by the pleasures and comforts of a beautiful home.

Nature is a painter and handles a delicate brush, and in her handiwork what colors, what charming colors, are found. These so nobly bold, those so delicately languid, what a glow is enkindlled in some, what a gloss shines upon others. In one methinks I see the ruby with her bleeding radiance; in another the sapphire with her sky tinctured blue, in all such exquisite richness of dyes, as no other set of paintings in the universe can boast, and whether they are blended or arranged, softened or contrasted, they are manifestly under the conduct of a taste that never mistakes, a felicity that never falls short of the very perfection of elegance. Fine, illimitably fine, is the texture of the web on which these shining treasures are displayed. What are the labor of the Persian looms, of the boasted commodities of Brussels, compared with these curious manufactures of nature? Compared with these the most admired chintzes lose their reputation, and even superfine cambrics appear coarse in their presence.

Added to all this beauty and comfort which it is the privilege of every horticulturist to have are the blessings of pure air, good

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water, an unobstructed view of the sky and the horizon, wholesome and unadulterated food, plenty of elbow room and no man to call master upon whose caprice depends their opportunity for a livelihood, an independent old age, and who of us but looks hopefully to that supreme earthly desire? Nothing is more sad or wretched than dependent old age, so nothing else brings so great joy to later years as the assurance that when winter's frosts are showing in the hair, and the sun of life is westering, there shall be no want, no poverty, but comfort, cheer and plenty.

Broadly speaking, the pleasures which we enjoy come to us through one or the other of our senses. Let us see what opportunities there are for pleasure in horticulture. First for the eye; we are surrounded by all of God's beautiful out of doors, and to me "streets of gold and jasper walls" can never be as beautiful as the bluegrass sward dotted over or bordered with flower and shrub and tree, stretching as far as the eye can see to the point where it meets the blue vaulted dome above us. This vast, beautiful and ever-changing panorama is ever before us, and no matter how weary feet, or back, or arm may be, we have only to lift up our eyes and immediately forget ourselves, wrapt in the wondrous beauty all about us.

For the palate, we have opportunity for the very best the earth affords. Then the various perfumes which greet our nostrils. The true lover of flowers can always smell the rose above the mold. The choicest perfumes are not to be compared with that of the bloom of the lilac, linden or wild grape, and to what shall we compare the aroma of ripe apple or grape? And for the ear what a blissful world is here? Far from the din of clanging steel and shrieking whistle, intermingled with all manner of discordant sounds; instead of those we have the twitter of the little wren, whose nest is perhaps among the vines on the veranda, the jubilant song of the thrush or the lark, the lowing of kine, or the tinkling of the cow or sheep bell in the woods beyond, the busy hum of the bees, or the sough of the wind among the trees, all pleasant, melodious, soothing. They all unite in bringing joy and rest and peace to the steady, strenuous, robust workers in horticulture.

Violin duet, Elizabeth Waterbury, Aileen McGrath; Catharine McGrath, accompanist.

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HOME LIFE ON THE FARM.

Miss Nichols, Polo.

When studying the life of a nation, race or clan how anxious we are to know something of the homes of the people in whom we are interested. There is no surer index to the intelligence, culture and tastes of a people than the homes they maintain and from which they send representatives.

Every advancement of the human race has been marked by the bettering of its habitations. In our own land, from the wigwam of the red man to the palatial homes of the twentieth century. Sixty years ago log cabins dotted the prairies of the Middle West; today houses with conveniences undreamed of by our ancestors are found on many farms.

There is nothing that adds to or detracts more from the life of the farmer and his family than the home and all the environments and influences that go to make that home. The poet has sung of the meadows, brooks, hills and trees and in his imagination he smells the fragrance of the new mown hay and the fresh perfume of wild flowers and sees the glistening of the jeweled dew in the grass and so on, but we who have spent our lives on the farm know this is the poetry of farm life and that most of it is prose. Yet there is no life that so nearly reaches an ideal one as that of a farmer. No vocation has as great an unfolding, enlarging, cultivating, educative, elevating process as its results. Then why shouldn't the home itself in every particular be an ideal one—be a fountain from which flow influences that will make the lives of the boys and girls of today who are to be the men and women of tomorrow full and rich, possessed of the desire to attain to what is highest and best.

The farmer often thinks the buildings, house especially, yield no income, consequently a poor place to put his money; and it can be lived in without the surroundings and conveniences that mean so much to that home.

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There is no place on earth where a beautiful home can be enjoyed so much as on the farm, and every cent spent adding to its attractiveness is returned a hundredfold in the love for that home by the family who live in it.

The farmer and his family spend more hours of every day together enjoying home life than families of any other occupation. Surely it is true economy to spend money and time to make a home all it should be when the results are so far reaching. Of course there are those who cannot always do that which will contribute to their highest comfort and efficiency, but many a farmer overestimates the value of a dollar in comparison with the intellectual and moral well-being of the family. To accumulate acres, comforts and conveniences are sacrificed that would have removed the thought of drudgery from the work and increased the love of farm life. Our surroundings mean so much to us all, even the strongest are not beyond the reach of environment, no matter how independent, strong-willed and determined our nature, we are constantly being modified by our surroundings, and in no other walk of life is this truer than that of the farm, isolated to a certain extent from social life, the home itself must supply what is needed to equip the boy and girl to become citizens who will go out into the world to do their part in creating and upholding standards that will improve, elevate and encourage every move for bettering the human race.

The problem of keeping boys and girls on the farm will solve itself if the farm is a place not only to make money, but a home in the broadest sense of the word.

Now, with the trolley, the rural mail delivery and telephone every advantage is possible to the farmer and his family. The longest rainy day or evening vanishes if the table is covered with papers, magazines and good books. One may go into many of our farm homes and find a Chicago paper, local paper, stock or farm paper and maybe a religious paper. All these are good; every boy and girl should be encouraged to read the newspaper; there are many who object to this and give good reasons, but much of the news of today will be the history of tomorrow, social, financial and legislative. There is certainly much in our daily papers neither elevating nor instructive, in fact, very objectionable, but with proper training the child soon knows the good from the bad, the true from the false, and early in years learns to follow the great moves of the world and loses all interest in the petty,worthless affairs that leave little or no impression upon the canvas of life. In addition to this reading, magazines that review and discuss the

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questions that are stirring the minds of the people should be found in every home. In these days of clubbing rates a few dollars go a long way in supplying a number of the best magazines of the day. In some communities a circulating library of books brings good literature to the country homes, but it is much better to have books belong to the homes and there are very few farmers who are not able to add each year a few new volumes to a library. By doing this, an atmosphere is given a home that it can attain in no other way and will serve as a magnet to keep and hold the rising generation to the farms, and no matter where their lot may be cast they will not be strangers in a strange land, for their reading has kept them in touch with all peoples and all lands.

Outside of the immediate home no feature of country life helps or hinders the making of an ideal home as the school where the most vigorous hours of the child's day is spent. The farmer has the entire responsibility of the making of this school. The welfare of our country school is said to affect more homes directly or indirectly than the educational systems of the towns and cities. Were the farmer's school tax three times what it now is he could not put his money where he would realize one-third as much from the investment as when used for the bettering of his school. There is a growing interest in the improvement of the rural schools, but owing to the conservativeness of the farmer himself improvement has been slow. When we know that in many states eighty-five per cent of the children of the country schools never pass beyond the boundaries of the school district so far as school training is concerned, it is time to ask are these children getting the best there is to be obtained along the lines of instruction and training.

The character of the home life on the farms of future generations depends upon this instruction and training. With the uniform course of study now used there is no reason why a good business education with the realities of a larger life should not be given every boy and girl. To accomplish this, adequate compensation must be given to justify teachers to qualify themselves not simply to meet the requirements of the superintendent, but to acquire breadth and depth of training that will make that teacher an inspiration to the farmer's children to aspire towards the best things of life, to that which will develop them into citizens who will stand for what is noble, good and true, who will have a wider outlook, and who will be in sympathy with all that is best and richest in country life. It has been a hard matter to arouse the average farmer to the importance of requiring a thorough preparation of those who desire to be teachers in our country schools, but in no other way can our rural schools be made what they should

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be. The consolidated school plan may be the future solution of this question, but the present must be dealt with in some other way. There is no life that so well prepares men and women as they go out into the world to stand alone, think for themselves, and to act independently, as that of a farm life. At an early age the child is given little tasks to perform and held responsible for their results. Responsibility is a great power developer. Where there is responsibility there is growth. People who are never thrust into responsible positions never develop their real strength. This is one reason why so few strong men and women are found among those who have spent their lives in subordinate positions, in the service of others. They have done no thinking. They have simply carried out other people's programs. The way to bring out the reserve in any person is to throw responsibility upon him. If there is anything in him this will reveal it. The old philosophy is, if there is anything in a youth it will come out. It may and it may not. It depends largely upon circumstances and surroundings. The greatest ability is not always accompanied by the greatest confidence or greatest ambition.

Certainly there is no place that can supply the incentives for the development of these qualities to such an extent as the home on the farm. In a recent conversation with one who has had a lifelong experience in furthering the education of boys and girls from city and country schools declared the pupil whose fundamental training had been received at the home on the farm was well equipped to concentrate and hold the mind to his task, be it long or short, interesting or tiresome to him. This may be accounted for by knowing that every child at an early age is given his work. Usually made responsible for the life and well-being of some plant or animal; from this beginning they soon feel the responsibility of several plants and animals resting upon them and so on, until they learn to devote all the energy they possess upon any charge given them, caring for animal or plant life, translating a sentence in Latin or solving a problem in geometry, and finally as men and women meeting successfully all requirements of the world, be it in the line of finance, state affairs or leading mighty armies to victory.

The farmer is prone to bury himself in the practical, thinking what is only useful, money producing, to be essential, forgetting there are things which tend to better hard conditions and to make things go a little easier, a little pleasanter. If you go into the homes of these extremely practical farmers you will be struck by the absence of the beautiful. You will find the solid and the practical everywhere in evidence without any attempt to combine beauty

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with usefulness. Why should not our farm homes be places to be made beautiful as well as places to accumulate dollars? The continual emphasis on the bread and butter side of life to the neglect of that which makes a real life is dwarfing to the best in every man or woman. It does not require the expenditure of so much money as thought and care to fill our homes with an atmosphere of beauty. One good copy of a real work of art, a Corot or Millet, often costs no more than one that is merely a bad mixture of colors or a sentimental face and will be worth a dozen such in the cultivation of a taste and love for what is really worth the name of art.

It is very fortunate for the world that there are those who think more of putting beauty into life than of making dollars, and who realize that it is as destructive of the best that is in us to overemphasize the practical as to rush to the other extreme of extravagance and frivolity.

The earth would be a barren place if it were not for the beauty lovers. The love of the beautiful was implanted within for unfoldment, for expression, and it is just as much the duty of every one of us to cultivate it in its best and highest sense as it is to provide for our mere animal necessities. The love of art, of flowers, of beautiful scenery, of harmonious surroundings, of noble literature, music and all the higher things that tend to lift man out of the basement of his being to the highest stories should be fostered with the greatest care. It is a duty we as farmers owe to God, to ourselves, and to civilization to raise ourselves to our highest power in all ways. In the doing and accomplishment of this the home life on the farm will be such an attractive as well as profitable one that the question of how to educate our young men and women to stay on the farm will be settled and settled right.

TUESDAY—MORNING SESSION.

REPORT OF COMMITTEE ON REVISION OF FRUIT LIST.

The Committee on Revision of Fruit List offered their report, which was, after amendment, adopted, as follows:

APPLES.

Summer Varieties—Yellow Transparent, Red Astrachan, Duchess, Sweet Bough.

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Fall Varieties—Wealthy, McIntosh, Fameuse (Snow), Dyer, McMahon, Ramsdell Sweet.

Early Winter—Jonathan, Grimes Golden, Dominie, Wagener.

Late Winter—Salome, Willow, Minkler, Ben Davis, Tallman Sweet.

Pears—Standard: Flemish Beauty and Lincoln for early; Keiffer and Lawrence for Late. Dwarf: Howell for early, Duchess for late.

Peaches—Champion, Elberta, Alexander.

Cherries—(Early) Richmond, Montmorency, English Morello.

Plums—Pomona, Burbank, Surprise, Wyant, DeSoto.

Blackberries—Snyder.

Raspberries—(Red)—King for prairie or rich soil. Cuthbert for clay or light soil. Black—Kansas, Older, Gregg. Purple—Columbian.

Grapes—White—Moore's Diamond, Niagara. Red—Brighton, Woodruff. Black—Moore's Early, Worden, Concord.

Gooseberries—Downing, Chautauqua.

Currants—Victoria, White Grape, Pomona, Wilder.

Strawberries—Staminate, Dunlap, Splendid, Bederwood (Pistillate), Warfield.

DISCUSSION.

MR. HARTWELL—I am glad to see Moore's Early put on that list. It is a surprise to me that it has not been there before.

MR. SOVERHILL—This year has proved successful for Moore's Early. We sometimes get caught. The blight that we had this year on grapes did not come in time to affect the Moore's Early at all, and it was an exceptional year for that variety.

MR. HARTWELL—Every year has been exceptional with me.

MR. SOVERHILL—It is a good, reliable grape.

MR. BRYANT—I notice the Lombard is included among plums. Are we justified in recommending that for general planting? Of course there is no question about the quality of the plum and its

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productiveness as a rule, but with me it is impossible to get it matured in very many years and I find that is a very general complaint.

MR. HEY—It is no good. I have about twenty-five varieties of plums and I never could get much out of the Lombard. I had one Lombard tree that was grafted on the wild plum, that was top worked and it did fairly well, but we just stand over it and spray it nearly continuously to keep the plums from rotting.

MR. MORE—Have any of you tried the Moore's Arctic?

MR. HEY—I have tried it and never could get the tree to live.

MR. HARTWELL—Native plums are the only things that it will pay to plant.

Motion to strike Lombard plum from the list was put to vote and carried.

MR. CUTLER—I think we ought to add the Eldorado blackberry. It does nicely with me.

MR. FRIEND—The Eldorado is not quite hardy enough. It suffers from extremely cold weather. It does not kill, but it is not quite hardy enough.

MR. CUTLER—How about the Ancient Briton?

MR. HEY—I have had the Ancient Briton planted in one place; it never had any cultivation, yet bore a crop every year and it bids fair for another crop.

MR. BRYANT—I think in this list we are not justified in adding new varieties, or varieties that are untested over quite a section of our country. We want to put in something that can be generally recommended and the fact that a variety does well with one individual in a certain locality is no reason why we should put it on the list until it has had a chance to be tested over a considerable section of the country. I think we should be careful about putting in newer varieties here until it is established that they are successful over quite an extent of our territory. I am saying nothing against the varieties in question, because I do not know anything about them.

MR. SOVERHILL—The Snyder blackberry is condemned very much for being sour. That is the great objection. But it gets black, it is picked and put on the market before it is ripe. If you let the old Snyder hang until it gets thoroughly ripe, it is a good berry.

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GUY A. BRYANT—On the list of currants, I think the Wilder should be added. I do not think there is a currant growing in Northern Illinois or anywhere in the West that will give you better returns, give you larger fruit, larger packages, better flavored fruit than the Wilder. I think it has been recommended by nearly all the stations in the State. I would prefer the Wilder to the Pomona. The Pomona is a small bunch, while it is a full fruiter, the Victoria will discount it, as far as giving the amount of fruit and quality is concerned, and the Wilder is earlier than the Victoria, earlier than the Pomona, and the bunches are a great deal like the Fay. The Fay is a large bunch, larger berries, but it does not give very much fruit, but what you do get is a fine quality, large bunches, but the Wilder gives plenty of fruit.

MR. SOVERHILL—Mr. Bryant had some splendid specimens at our Fair.

GUY A. BRYANT—I have no objection to leaving the Pomona on the list, but I think the Wilder should be added. I move that the Wilder be added.

Motion to add Wilder to the list of currants was carried.

The report as amended was then adopted.

REPORT OF COMMITTEE ON MEMORIAL TO ARTHUR BRYANT.

The tie of personal friendship is a large element of strength which makes for the usefulness and influence of this Society. The pioneer work of an organization of which this is a type is associated with a few individuals of strong personality and self-sacrificing natures.

The Horticultural Society of Northern Illinois has been held true to its course of advancement and usefulness to humanity in which personal gain was always subordinated to the general good by a few large hearted, noble minded men. The fabric which constitutes the history of this society would be a tattered shred if by any magic the name and influence of Arthur Bryant could be withdrawn from its records and the work which it has accomplished.

Quiently, firmly and lovingly he has stood for all that is conservatively true and wisely progressive in horticulture.

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We grieve over his departure as that of a wise teacher and loving father. We shall deeply miss his kindly benevolent face and wise counsel. And it is with the feelings of deepest sadness when we reflect that in the future his name will not appear on the records of this Society as one of its members.

To those who are near and dear to him by ties of blood we extend our deepest sympathy and high appreciation of his many noble qualities of mind and heart. We do hereby resolve that a copy of this expression of our appreciation of Mr. Bryant be published with the transactions of this Society.

J. L. HARTWELL,
E. A. RIEHL,
S. G. SOVERHILL,
Committee.

REPORT OF COMMITTEE ON MEMORIAL TO EDGAR SANDERS.

Edgar Sanders was born in England, came to this country in 1854, and died in Chicago September 29, 1907, at the age of 80 years.

One by one the pioneer members of this Society are passing away, and now of those who were connected with its organization or its early history and who early gave it a high place and rank amongst horticultural organizations, very few are left.

Edgar Sanders was a man not to be forgotten by any one who was ever acquainted with him. Of large frame and impressive bearing, his genial, kindly face seemed to be irradiated with benign influences. He was one of the first commercial florists of Chicago and lived to see the business develop to immense proportions. Successful as a florist, the commercial side seemed secondary to his love for his profession, in which he was regarded as high authority, and the public owe him a debt of gratitude for his work.

As a slight token of the feeling of this Society, be it

Resolved, That in the death of Edgar Sanders we feel deeply the loss which we have sustained, and that a copy of this memorial be spread on the records of this Society and published with its transactions.

L. R. BRYANT,
J. L. MOORE,
Committee.

On motion, the foregoing reports were adopted by a rising vote.

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STRAWBERRIES—WHO SHOULD GROW THEM AND HOW?

E. A. RICHARDSON, SPARTA, WIS.

The fact that the strawberry is the earliest fruit on the market and also one of the best that we have, has made it the subject of more papers than any fruit that comes to our table, and yet we may be surprised at the number of people who are entirely ignorant of the manner in which it is grown.

Admitting that it is one of the best of fruits, I think that it is one of the most abused of fruits; for how often we see a box or case a little more than one-half full of pale, sickly looking strawberries sitting in front of our grocery, perhaps one-half of them picked at least two days sooner than they should have been. If these same berries had been left on the vines until they were ripe, they would have presented an inviting appearance and been good enough to grace the table of a king.

My earliest recollection of the strawberry is when, as a small boy, I enjoyed the privilege, on Saturday afternoons, of taking my little basket and wandering down to the old meadow lot, there enjoying a half holiday trying to secure enough strawberries to grace our table with a shortcake on Sunday for dinner.

I firmly believed at that time and my experience in later years have not changed my mind any, that there is nothing quite so nice to satisfy the appetite as a good old fashioned shortcake like mother used to make.

The strawberry is not a very particular fruit as to where it is grown, but like every other fruit or plant, the better care and cultivation you give it, the better it will thrive and respond to your desires. Each section of the country has its individual variety, which appears to grow and thrive much better than some other variety; thus we find that in parts of Missouri they grow the "Aroma" and "Gandy," in Hood River the "Clark's Seedling," while in Louisiana they grow the "Lady Thompson," the "Klondike," and others which we in Wisconsin are unable to raise at a

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profit to us; but I think that there is no part of the United States but that we may find this fruit growing in greater or less abundance.

In growing the strawberry we see no reason why any person who has one square rod of ground need go to the corner grocery to get their daily supply of this most delicious of fruit during the seasons while it is on the market, for it is one of the easiest of fruits to be grown which is brought to our table; but as to growing it for the general market the competition has become so great and transportation facilities so much better than in former years, and the markets all over the country are demanding the best there is to be had, and only those who have a liking for the pursuit of horticulture that those who are willing to put their very best efforts in the production of a superior article, will make a success of it financially.

The conditions surrounding the grower have a great influence many times in his success or failure; if a person is located in a country where they do not have access to good shipping facilities, or where the home market is but a limited one, then it would be useless for him to engage in the wholesale raising of the strawberry; and even though he had these markets at his very door, and though other conditions were alike as favorable, then to be successful he must be industrious, practicing ceonomy and above all things be a diligent student of nature, that he may be able to do battle with the various diseases and insects that combine to make the path of the horticulturalist so fraught with despondency.

I call to mind a person in my home city who, after having engaged in the mercantile business, acting as real estate agent, promoter of a telephone company, and also a sewing machine agent, finally last spring concluded to make his fortune growing strawberries, so secured a piece of land and set out about seven acres; all went well until the weeds grew to be about three feet high, then he concluded to cut them down and use them for mulch, as he said that he had heard that the berries had to be mulched for winter. This method of cultivation resulted in about one-fourth stand of plants for fruiting next season, nearly an entire summer's work gone for almost nothing, and a field that would put to shame the most crude farmer or tiller of the soil in the State of Illinois. We cannot but question the advisability of such men engaging in the raising of the strawberry for general market, for if he will not take proper care of the plants while growing, he cannot be expected to exercise the proper care in picking, packing and preparing his fruit to be placed on the market in the best possible shape.

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Out of a membership of about 230, in our association at Sparta, we have at least 100 growers who should not be growing strawberries for the general market, as they are either too careless in regard to picking, packing, etc., or they do not have time to devote to the details of the business which invariably means success or failure. It would be my advice to those who are contemplating the growing of this berry for market, if they have no natural liking for this kind of business, they had better pass it by and engage in some other pursuit which would be more congenial to them, even though they see their neighbor carrying his produce to market by the wagon load.

I do not know as I am qualified to tell you how to grow strawberries, although I have been trying to grow them for the last nineteen years, and each year I am bound to admit that I have adopted some plan (or hobby, if you wish) which after putting into practical use, I have been obliged to modify and sometimes to discard entirely. Every nurseryman in sending out his annual catalogue invariably gives directions for planting and growing them and yet in many instances, after reading these directions, we are induced to stop and ask ourselves how long we could continue in the business of small fruit growing if we had to take each plant and literally follow instructions as laid down in these catalogs, as to setting out, cultivating, hoeing and tending them throughout the entire season. A neighbor of mine, after studying all the literature he could get hold of on the growing of the strawberry for one entire winter, started in the spring to prepare the ground for his plants. After having it nicely prepared it commenced to rain and the ground became as hard as before cultivating; after preparing it a second time and having in the meantime set a portion of the field, it commenced to rain again and continued for about two days, resulting in the ground becoming as hard as before. My poor neighbor came to me and wanted to know what he should do; he says, "I have studied everything in regard to the growing of the strawberry, but cannot find anything where it tells what to do when it rains every two or three days."

Thus we see that it will be necessary for us to use our own judgment, coupled with what information we may glean from the best literature we can get on this subject, to make a success of the growing of the strawberry, as conditions will arise for which no law or information has been laid down.

The most essential thing in the growing of any fruit is to get good, strong plants, and unless you do this you are very liable to be disappointed in the results obtained.

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After selecting my plants and thoroughly preparing the soil for planting, I mark the piece to be planted both ways so that when plants are set they will be in rows, as it greatly lessens the cost of production when you can do most of the work with the horse and cultivator.

Plants are set three feet nine inches between rows and two feet ten inches in the row. This distance is not arbitrary and each grower should be governed by the variety of plants he wishes to grow; the essential thing, however, is to get them so that we can cultivate both ways. My plants are cultivated once every ten days and sometimes oftener if it is a rainy season, as it appears to be necessary in order to keep the plants growing nicely, to keep the soil well stirred and mellow. I usually hoe them as often as occasion requires, cutting out all blossoms each time. The past season, one yard containing one and one-half acres, was hoed four times, while a yard which contained five acres was hoed only twice, the difference being in the location. The five acre lot was a sandy loam and very free from foul seeds, while the one and one-half acre plot was on very heavy soil and required more attention to keep it in condition.

The first week in July usually finishes our cross cultivation, but I keep the cultivator going between the rows until about the last of September. In all of our work we aim to get the very best results we can with the least amount of expense, not meaning by that that we do not give them proper care and attention, but to cultivate and hoe at the proper time, and to do as much of the work with horse and cultivator as we possibly can, as labor is scarce and wages high.

After having tried setting plants with the machine, I have come to the conclusion that I can get better results by setting them in the good old way by hand, although my neighbor says that if he had to set by hand he would have to go out of the business. My fruiting beds were sprayed twice during the last season before the blossoms were out, and my new setting was sprayed three times with Bordeaux mixture, using the liquid spray. It is as essential in our section to have the yards covered as soon as the ground is frozen as it is to set our plants in the spring, as the open weather after the ground has become frozen is conceded to be as detrimental to the plants as it is later in the season.

In conclusion I will say that a few "don't forgets" which were gleaned from a recent publication appear to be timely and to the point and should be adopted by every person who is growing the strawberry for market.

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"Don't forget the golden rule, and do unto others as you would have them do unto you.

"Don't forget that every quart of berries is picked and packed for some one to eat.

"Don't forget to pick and pack them as you would like to have them if you were buying them to eat.

"Don't forget that if you were paying twenty cents per quart for strawberries you would want the boxes filled from top to bottom with good, sound, ripe berries.

"Don't forget that you can by a little painstaking instructions soon teach your pickers to fill and round up their quarts so that they will not need repacking.

"Don't forget that repacking bruises the fruit and often hurts the sale of our berries more than anything else.

"Don't forget to have your pickers understand that you will pay a full price for picking a full quart and a scant price for a scant quart.

"Don't forget that a good, honest, attentive, generally respected lady or gentlemen will make you more money working right with the pickers, seeing to it that all of the quarts are properly filled, and rows properly picked, than three or four packers will at the shed, turning and returning the quarts, tumbling and bruising the berries several hours after they have been picked.

"Don't forget that you can get your berries into the shade several hours sooner by this plan than you can by trying to properly fill and repack thousands of carelessly filled quarts with a lot of 'jolly' high priced packers at the shed.

"Don't forget that the sooner your berries are placed in the cooler after they are picked the longer they will carry.

"Don't forget to try to make a good name for yourself and your products.

"Don't forget, in the beginning of the season, to let your berries get ripe before picking them, but as the season advances and the weather gets warmer, pick them greener, I don't mean green, just pink."

These points, if properly followed out, will aid us greatly in overcoming some of the disagreeable features of our work.

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DISCUSSION OF MR. RICHARDSON'S PAPER.

MR. HEY—Do you follow the hedge row system?

MR. RICHARDSON—No, we follow the matted row system, the full row; it is usually about two and a half feet wide. All the plants filled right in.

MR. HEY—Just as thick as they will grow?

MR. RICHARDSON—As thick as they will grow. The last three years we have had no trouble about getting too thick, previous to that they used to grow thicker. The plants with us have been very poor for the last two or three years and it has been a hard matter to get a good stand.

MR. HARTWELL—Do you check your fields both ways?

MR. RICHARDSON—I check mine. They do not usually do that, but I check mine both ways. I have a marker that is twelve feet long made out of a fence board with a board about a foot in length fastened on each side, making marks one side one distance and the other side the other, that is drawn by hand by the party who is marking. It is light, probably does not weigh over twenty-five to thirty pounds. He takes it, drags it behind him in that way, going across the field; it makes a nice mark.

MR. HARTWELL—What is your tool?

MR. RICHARDSON—We use a spade for planting, with a boy to drop; an ordinary spade.

MR. HARTWELL—How do you press with the foot then?

MR. RICHARDSON—We put the spade on the ground, press it in with the foot, then bend it forward and the boy drops the plant right in behind the spade. Then pulling the spade out, it lets the dirt drop in against the plant. We will put in about 4,000 plants a day. I tried last year and two years ago setting with a planter, the regular tobacco planter; some of the larger growers use that a great deal for setting plants, but I myself have never had very good success with it. The planter will shove the roots of the plants all solid together. It being a tobacco planter, the pressure of the roller on each side of the shoe will shove the roots together, and it does not give them a chance to spread out fan-shaped, as they should.

MR. HARTWELL—I adopted a tool that Mr. Schofield from your State showed how to make at a Sterling meeting of this Society six or eight years ago that I cannot find any improvement on. A

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trowel that is sharp pointed, I should say about seven inches, and a handle possibly ten inches in length at right angles. That is operated as a spade is, only the party is down on his hands and knees, and I do like to firm my berry plants with my fingers.

MR. RICHARDSON—Well, in firming our plants, after we put the plants in behind the spade, the person handling the spade as he draws it out, presses his foot just in front of the plant, that will put the plant in so solid that you cannot very well pull it out with your fingers; it is planted solid enough if the crown of the plant is right at the top of the ground, and we have had very good success that way. We can go over the ground quite rapidly; when we have four or five or six or eight or ten acres to plant, why, time is money with us, as labor is high.

MR. HARTWELL—I can plant five thousand a day with my arrangement, but my knees get tired before I get through.

MR. HEY—What varieties do you plant?

MR. RICHARDSON—We use largely the Warfield and the Senator Dunlap; the Senator Dunlap for fertilizer. It is a dryer berry, I think, than the Warfield; it will ship well; it is a good looking berry and on heavy soils it will hold its size throughout the season. On light sandy soil we find it is liable to run a little small.

A MEMBER—Did you ever plant the Captain Jack?

MR. RICHARDSON—We used to have the Captain Jack, but we do not raise it any more. There are growers there that are experimenting with the different kinds all the time, and in fact I had two acres this year of a seedling of my own that I raised from seed seven years ago; they returned me about sixty-two cases for two acres, that is, sixteen-quart cases, and they were very productive for this year, but the berry is too black when it is ripe for the market, and it has a green tip on the end, so that I think I shall discard it another year. One reason why I hung onto it—it produced quite a good many in October after the fruiting season was over and I wanted to get a few of those.

MR. BRYANT—The commercial strawberry growers generally say that in planting the Dunlap you want to be careful to keep them from getting too thick, thinning them out to get the best success.

MR. RICHARDSON—That is true generally, but the last two or three years we have not been bothered by that, because our plants have come in too thin, the same as with the Warfield; they were not too thick by planting them far apart as I did.

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MR. HEY—In the matted row, how thick would you consider too thick?

MR. RICHARDSON—Why, anything that is closer than six inches together is too thick in the strawberry bed; in digging plants in the spring, where you get fifteen out in one forkful. That is too thick.

MR. CUTLER—How do you generally get your plants, raise them or buy them?

MR. RICHARDSON—We usually raise our plants. If we want a new variety, we send away and get the variety we want and then put out a propagating bed, I raise my beds in that manner.

A MEMBER—Do you aim to get pedigree plants?

MR. RICHARDSON—I do not know anything about pedigree plants. We try to get the best plant we can, but that is the entire question.

MR. HEY—They use nearly the same kind of a trowel that Mr. Hartwell described, at the Kellogg farm; they have them there by the hundreds; in planting 100 acres of strawberries they need them and it is very nearly the same, except the angle of the grip part is a little different.

ENEMIES OF THE STRAWBERRY AND HOW TO COMBAT THEM.

J. L. HARTWELL, DIXON.

The larva of the May beetle, leaf roller, root lice, a small black bug which for want of a better name I will call flea beetle, rust, weeds, strawberry plants, frost and drought is a fairly complete list of the chief enemies of the strawberry.

Most strawberry insect pests are comparatively slow in changing their place of residence. It naturally follows that an effective way of combatting this class is a frequent change of site. The flea beetle and leaf roller may appear on one side of a square acre tract and not reach the opposite side by the end of the season. One of the favorite resting places of the May beetle is an old strawberry field, so that the older the field as a rule the more the infection of white grub will be. The grub's presence is shown by a wilting plant. Investigation will reveal a big white grub beneath the

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plants. Its roots are in the grub. Pinch his head and you will have more plants in the fall. The presence of root lice is revealed by ants. They are partners, the same as in the corn field, but the lice I am told are not of the same variety. Frequent cultivation is discouraging to ants and correspondingly to the lice. The lice have no power of locomotion for long distances. The eggs are carried by the ants when a change of pasture is desirable; this of course is slow work, so they are rarely troublesome in a new field.

Probably the most destructive of the strawberry insect pests is the leaf roller. Whole fields are almost stripped of leaves as by a fire. They seem to appear and disappear again without any apparent cause. My impression is that they thrive best in dry seasons.

If I am ever seriously infected by leaf rollers again, I shall take but one crop from each planting. Burning immediately after the crop is removed is an effective remedy, but care must be taken or the plants will go with the pests.

The rust, like some other pests, works more destructively on some varieties than on others. As far as possible, plant rust-proof varieties. I suspect that burning reduces the rust germs. Like all fungi, rust is more destructive in wet than in dry seasons. All bulletins on this subject confirm the statement that spraying with Bordeaux controls the strawberry rust.

On the question of the immunity of some varieties from certain pests, I had this bit of experience during the season just past. A row of Warfields forty rods long was nearly destroyed by root lice, while two adjacent Dunlap rows were scarcely touched.

Frequent and thorough cultivation is the sovereign remedy for weeds and drought. The cultivator went through my three acres of new planting nine times this season, and the hoe almost as many.

In ordinary seasons I find the weeder a useful tool which is used until runners begin to set. This season was too wet. The hand rake will accomplish about the same results in the farmer's garden.

Ordinarily the worst enemy with which a strawberry plant must contend is another strawberry plant. More growers fail from having too many plants in a row than from any other cause. As a rule the most productive varieties are the best plant setters. Under favorable circumstances where plants set not closer than six inches apart they will each develop a quart of roots. Where plant

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setting is not controlled and the plants become massed like a sod of white clover or blue grass, the roots of each plant will not occupy the space of a gill.

The effects of drought and frosts may be at least partially obviated by heavy mulching, which should be removed to the space between the rows at the commencement of growing season. It may be placed over the rows again during prospectively frosty nights of the blossoming season.

Permit me to repeat in closing with as much emphasis as possible the importance of frequent changes of the site of the strawberry patch. "My bed has run out," or "has something the matter of it," is the "oft-told tale" of the customers who come to me for plants. I could not name on the fingers of both hands the number of people in Dixon and vicinity who have started to grow berries for market and failed because they neglected to observe this rule. They are frequently more than ordinarily successful the first year or two. Their ground is new for strawberries and has little or no infection. They proceed on the theory that I find is quite prevalent among farmers especially, that a strawberry patch like a permanent pasture when once established is for all time.

Discussion of Mr. Hartwell's Paper.

A Member—Tell us something about the use of fire.

Mr. Hartwell—Well, I have had all kinds of experience. I destroyed quite a large field, and I am not sure that I know the best thing to do, but my impression is that when the ground is quite dry you are more likely to kill your plants than when it is not, and I have adopted a policy like this: My fields are all mulched and all the straw is placed between the rows during the growing season. As soon as we feel the spring frosts are over the straw is placed between the rows and it lies there during the picking season, then the mower is run through, the weeds and the foliage drop right onto the row; a fire put in there will lick up the whole thing, provided you have not too much green stuff there that cannot be burned. I did a thing this year that produced the very best results I ever had. I ran a spring tooth rake lengthwise from the row and that pulled practically everything out of the row; it did not tear this straw up between the rows; I then took a fork and loosened that up a little and then struck a fire; it ran down these weeds, did not damage my row, and I have an excellent stand for the next year. My experience is that I get the very best crop from the second plantng. That to me is explained this way. It is rare a grower that has a matted row does not get too many plants

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in his row and practices plowing away from each side of the row and then dragging both ways and tearing out possibly three-fourths of the plants; you get your plants very much thinned and they cannot catch up the next year to give as thick a growth as before and that gives a better crop. It is a dangerous thing to let a fire run across a row and I suspect if we can get a good stiff wind and carry it away with a rush, that we get it off quickly and it will not do any harm.

MRS. HEY—Did you say anything about what might be done for the plant root lice?

MR. HARTWELL—I believe I omitted a paragraph in which I said that frequent cultivation was very annoying to the ants, that I found that they get tired of having their nests turned up.

MRS. HEY—Destroying the ants would not destroy the lice on the roots?

MR. HARTWELL—If you break up one partner of the firm, you are apt to break up the firm all the way through.

MRS. HEY—In what way would you know it was root lice other than by the presence of the ants?

MR. HARTWELL—The presence of the lice upon the roots, why, they are small; it would almost take a magnifying glass to see them.

MRS. HEY—Do the lice destroy the new roots?

MR. HARTWELL—They do not eat them; like any other lice, they live by their suction powers; they have a little beak that they thrust into the root and suck the life out of it.

MRS. HEY—I know there were ants in places where plants looked like that and also plants where the roots looked practically the same where there were no ants, and I supposed we had sour soil, something of that kind.

MR. HARTWELL—One of the worst ground pests that we have is the root louse and it is absolutely dependent upon the ant for its existence. The ant manipulates the eggs, puts the eggs upon the roots so they can hatch their young on the roots; they cannot travel much, and they suck the life from the roots and the ants get their compensation from eating the deposits of the lice.

THE CHAIRMAN—They have a chemical now that they stick the seed corn in, that prevents the ants and lice from working on the roots. Would it not work on the strawberries?

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MR. HARTWELL—Very likely. There is this thing about it, that enough of the stuff to operate upon a large amount of corn would cost more than the corn is worth. It is not a practical thing at all. I understand it is a very expensive thing, the oil of lemon peel.

A MEMBER—It costs about ten cents per acre.

MR. HARTWELL—I am only quoting Prof. Forbes; he told me it was not practical. Ten cents an acre would not cut much figure.

A MEMBER—Would you cultivate your plants after the blossom appeared?

MR. HARTWELL—I do not know just what you are thinking of, but I guess I do. Our fields are mulched. The Michigan men sometimes recommend removing that mulch and then putting it back again and then cultivating during that period. I never have done it; I doubt if it is practical. It is a big job to get that much mulch out of four or five acres so you can run your cultivator.

THE CHAIRMAN—How late do you wait before you put on your winter mulch?

MR. HARTWELL—My experience is this, that it does more harm to put the mulch on when there is no frost whatever in the ground. I have mulched my ground when the ground was comparatively warm, but I have always delayed it until I think most of the growing is over, and if the ground is not mushy and wet, I drive my wagon on the field when there is no frost whatever.

MR. RICHARDSON—Is it not better to mulch early before the ground freezes than to wait until after it freezes?

MR. HEY—With us we find where we mulch early before frost has touched the plants, we get a cleaner, nicer foliage in the spring, and that goes a long ways toward maturing the crop. We find where we leave them until after the early freeze in the fall turns the leaves brown that it saps the life of the plants and we do not get as good a crop. When I mulched last year I drove onto my field when my wagon would sink in six inches in the mud, and I had good results. In the spring I could see how much better the foliage was. If the horses had stepped on a plant and pressed it down, it would spread out again and it would have no bad effect whatever.

MR. CUTLER—Would a sod plowed this fall be all right to put strawberries on the next spring?

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MR. HARTWELL—I would never plant on sod ground, because all classes of sod are favorite nesting places for the white grub. You would be sure to get white grub in sod ground.

MR. CUTLER—Would not the frost in the winter kill them?

MR. HARTWELL—Oh, no, the white grub will go four or five feet down. There is but one white grub whose history is known to the world and it took three years to get that history. Prof. Forbes has leased an acre of ground in the northern district, another in the central and another in the southern, with a man in charge of each acre, where he is going to set tile down into the ground three or four feet with a wire screen at the bottom of it, filled with soil and a male and female white grub, and they are going to raise a family in each of those tiles and they are going to watch the process to see how it is done and to see how long it takes to raise a family of white grubs. It is a two or three years' process. We want to know more about the white grub than we know now.

On motion of Mr. Bryant, O. L. McIlvaine, delegate from Central Illinois Society, was made honorary member.

THE FARMER'S PLACE IN HORTICULTURE.

GEORGE A. HUNT, WOODSTOCK.

The topic which has been assigned to me, "The Farmer's Place in Horticulture," is one on which a volume might profitably be written. I shall try to content myself, however, to touching only upon a few important points, leaving the details to be brought out by the discussion which will follow.

Almost any sensible farmer will readily admit that no farm home is complete without an orchard and fruit garden large enough to supply an abundance of fruit, at least for family use.

There are many farmers, however, who will say that they can buy what fruit they need cheaper than they can raise it. These people are about as correct in their conclusions as the Christian scientist who found a boy under an apple tree doubled up in a paroxism of pain. On asking what the trouble was the boy replied: "I've got the stomach ache. I've been eating some of those green apples and oh! how I ache!" "You don't ache," said the

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man. "You only think you ache." The boy looked up in surprise and said he, "Well, you may think so, but I've got inside information."

The boys and girls as well surely have inside information as to the value of fruit, and every farmer should raise a supply of fruit for the health and pleasure of his family, if for no other reason.

The farmer's family who have to depend upon the market usually have a very meagre supply.

There is no question in my mind that the acre or two devoted to the production of fruit returns a larger margin of profit than any other like area on the farm.

There are seemingly three great difficulties in the way of the farmer who would plant an orchard:

1st. The difficulty of selecting suitable varieties. Varieties that he can feel assured will be reliable and that will furnish a succession of fruit for the table.

2d. The difficulty of selecting and preparing the orchard site and planting the trees properly.

3d. The difficulty of giving the orchard proper care. This of course includes pruning, cultivating and spraying.

With the great variety of fruits adapted for growing in Northern Illinois, it should not be very difficult to select varieties that will do well and furnish a supply for the table during the entire season. Those varieties which are recommended by the Horticultural Society are safe to plant and it is also a good plan to set those varieties that are known to do well in the neighborhood. Any horticulturist of experience will be glad to give information to any one who is interested in regard to varieties which they know to be reliable and trustworthy. Do not plant many of the new untried sorts, even if they promise great things.

The apple orchard should contain not less than 100 to 200 trees. Several early varieties should be planted to give a succession of fruit for summer and fall use, but as the early sorts are usually good bearers only a few trees of each kind are needed. In order to furnish a liberal supply of fruit for early and late winter and spring use, a much larger number of trees are needed and it is advisable to select only a few of the most reliable sorts. A few pear trees as well as plum and cherry trees should be included.

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In selecting the orchard site it is well to have it protected as much as possible from the southwest winds. If there is no natural protection, it will pay to set out a shelter belt along the west side of the orchard.

The rows of trees should be not less than twenty rods long. The small fruit may be set in shorter rows if desired, but for convenience in cultivating with the horse they should not be less than ten rods long.

A good way to prepare the ground is to plow sod or stubble in the spring, laying it off in lands the width of the rows, leaving a back furrow where each row of trees will come. Plant the ground to potatoes and cultivate well. In the fall plow the ground again quite deeply. This time leaving a dead furrow where each row of trees is to be set. Pulverize and harrow the ground several times early the following spring and plant the trees early in order to have them well established before the dry hot weather begins.

The rows of trees should be at least thirty feet apart and the trees from twenty to thirty feet apart in the row; as before stated, the orchard and small fruits should be set in long rows for convenience in cultivating and should be as regularly cultivated as the corn and potatoes, especially for the first few years after planting when it may be desirable to seed down to clover.

Two hundred or three hundred strawberry plants, the same each of red and black raspberries, and blackberries and a dozen or so each of grapes, gooseberries and currants and an orchard of 100 to 200 trees of apples, pears, plums and cherries, if well cared for, will furnish a succession of fruit for the table, the value of which can hardly be estimated.

Considerable care should be given to the proper pruning and shaping of the trees, also to the cultivating and spraying.

I have learned by experience that there is nothing to be gained by heading the trees high, but everything to be gained by heading them low. Low heading protects from sun scald, protects from winds; apples are not blown off so badly and those that drop are saved from being jammed and bruised. The trees are easier to prune and easier to spray. The fruit is more easily picked and of great importance low headed trees come into bearing much earlier than those which are headed high.

I would recommend setting one year old trees and for upright growers like Whitney's Yellow Transparent, Wagener and Grimes

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Golden, I would advise heading not over eighteen inches high. Those of spreading habit like Wolf River, Minkler, Tolman Sweet and others of that type, I would head not over thirty inches high.

The proper spraying of the trees is one of the most important items in securing good crops of fruit; it is also the worst bugbear of all to the farmer who thinks he can not afford to spend the time to prepare the mixtures and apply them when needed. Several farmers may join together in the purchase and use of a spraying outfit, or any one who has the time may own and use the outfit and the farmers can afford to and will gladly pay him well for his time and the material used.

Probably three-fourths of the farmers in the dairy sections will declare that they cannot afford to spend the time necessary to establish and maintain such an orchard. As a matter of fact they can afford to do just that thing and if they will only go at it in a systematic way they will find pleasure and profit in the undertaking. There is little worth having that is obtained without some effort. It will take some effort to establish a good orchard, but it will return tenfold in the health and happiness of the family, in the increased value of the farm in providing healthful and agreeable employment for the children and in keeping them contented on the farm.

There is more than dollars and cents represented in the orchard and fruit garden on the farm and he who plants an orchard and cares for it well will never regret the time and money expended.

Among the pleasantest recollections of my boyhood are those which are in one way and another connected with the old orchard and its fruitage. I was given an apple problem a short time ago that was quite a sticker. The problem is as follows: How can you divide fourteen apples equally among nine children if five of the apples are very small? Our mothers solved this problem for us years ago. If you are unable to figure it out, let me know and I will tell you how it is done.

Discussion of Mr. Hunt's Paper.

A. Member—I would like to ask Mr. Hunt how he went to work to plow this ground to make a dead furrow for each row of apple trees.

Mr. Hunt—Well, in plowing it would be the same as making a back furrow. One spring plow the land so that you will throw a back furrow where your rows of trees are coming, then the following spring replow that land, throwing the furrow the other

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way; that makes the dead furrow come where your rows of trees are to be. Then when the trees are set, turn the dirt back onto the trees. I think it is a good thing to have the rows thirty-two to thirty-three feet apart. It does not matter so much about the distance the trees are apart in the row, that should be regulated according to varieties. If you are planting spreading varieties, like the Wolf River and Tolman Sweet, and other sorts that spread and grow rapidly, they need lots of room, but if you are planting Wagener or Grimes Golden, they do not need much more than half that room.

MR. SOVERHILL—I have been following that plan for twenty years. The year before I lay out the ground; I am very particular to measure it. I set my trees thirty-three feet apart and in the fall I plow in that dead furrow very deep. In the spring I set the trees and if there is a little fall in the ground any way, that is the way I want my dead furrows to run so as to afford a perfect drainage. It is very little trouble with that dead furrow to set your trees in there and put in dirt enough to hold them in their places; take the team and put up two rows of furrows against them, then a little top dressing, and your trees will grow well.

MR. HUNT—It is a very important thing to have good drainage for your orchard.

MR. BRYANT—I dislike to seem to criticise a paper which I think is a very excellent one. The only thing I would criticise about it is that I understand that he recommends planting from 100 to 200 apple trees in a farmer's orchard. Now, I am not speaking about those who expect to make fruit growing a business, but I mean an ordinary farmer, I think it is too many. One hundred or 200 trees will grow more apples than the farmer needs in one year, and I think the tendency is, if he plants so many, not to give them the best care, and I think if he lessened the number and gave the good care which he would be more likely to do, it is much the better plan and in the majority of years it will furnish all the apples that he needs and the ordinary farmer does not want to bother with marketing a few apples.

MR. HARTWELL—I am going to take the other side of that proposition.

MR. SOVERHILL—I will be with you, for this reason, if you put out a little orchard of twenty-five or thirty trees, there will not be enough in it to justify a man to fool with it. If he has 100 or more trees, he will get a spray pump and take care of it.

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MR. HARTWELL—I want to refer to a matter that I meant to have spoken of, and that is the Tolman Sweet. I have been for seventeen years at these meetings and I do not recall that I ever saw one of them exhibited on our tables. I have trees on my place as big as my body and I never had a single apple, and I do not think I have had an exceptional experience.

MR. SOVERHILL—They are excellent, good bearers. There is a tree that stood in our orchard forty years ago when I came there and it is bearing abundantly. We get good results from young trees as well.

MR. BRYANT—I want to say in regard to that, Mr. President, four or five years ago I cut down several Tolman Sweet trees that I think were nearly forty years old and I never saw them produce fruit enough to pay for the space they occupied.

MR. HUNT—I am surprised at Mr. Hartwell's and Mr. Bryant's experience, because the Tolman Sweet in McHenry county and in Northern Illinois where I live is one of the hardiest trees we have, and one of the best and most regular bearers. They are an apple that keep well, an apple that we think is one of our choice, our most reliable sweet apple, and the only sweet apple we have for winter use.

MR. SOVERHILL—I would like to ask Mr. Hartwell if he has a good sweet winter apple that he could recommend?

MR. HARTWELL—No, I do not know of any. I would like to get a winter sweet apple that I can tie to .

MR. HUNT—My recollection goes back to the old Sweet Bough trees, one of the most delicious apples grown in my section, and I have wondered why that should not be recommended by our Society. It is not as hardy as the Tolman Sweet, but it will surely pay for planting and pay well.

MR. SOVERHILL—The Sweet Bough is an early apple; what we are after is a good winter sweet apple.

MR. DAVIS—I would like to ask the gentleman, how deep do you cultivate and how often and how do you mulch your trees?

MR. HUNT—I would cultivate often enough to keep down the weeds while the trees are young until along in August perhaps, but I would not mulch until I seeded down the orchard. I think when you cultivate you want to keep up your cultivation pretty thoroughly and when you get through cultivating, then it is all right to mulch, but not until you stop cultivation.

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MR. BRYANT—Do you sow a cover crop when you cease cultivating?

MR. HUNT—Yes. We do not always do it, but we think it is the thing to do. We sow almost anything. Rye is good, or oats. It does not cost much to do that, probably oats is the best proposition for a cheap cover crop. It would probably be better to sow some leguminous crop as was spoken of yesterday. It is hard to find the right thing without being too much expense for the seed.

QUESTION BOX.

JACOB FRIEND IN CHARGE.

QUESTION—Tell us something about your dust spray?

MR. RICHARDSON—I never have had any experience with the dust spray myself; this year we used the liquid spray entirely. About the 18th of June, I, in company with the Vice President of the Wisconsin Horticultural Society and two other parties in our neighborhood, went to La Crescent, Minn., to Mr. Diamond's farm, who is using the dust spray. He has a Cyclone spray and he sprayed his strawberries and his grapes, about two acres of grapes and fifteen acres of strawberries. He likes it very much. He has a power spray; that is, he puts the machine on a two-wheeled cart; there is a sprocket wheel fastened to the wheel of the cart with a chain that runs this spray, and he was very enthusiastic over the effects that it had. He has sprayed three years with the dust spray, he had a smaller machine at first, this machine that he has now I think he used two years and his strawberries certainly showed the good effects of the dust spray. He sprayed one field twice while we were there and another field once.

MR. HARTWELL—Did he do any check spraying; that is, leave a section unsprayed, spraying the other and comparing the results?

MR. RICHARDSON—I think he did not this year.

MR. BRYANT—What did he put with his dust spray?

MR. RICHARDSON—He used the Bordeaux mixture; it is a mixture of blue vitriol and some manufactured preparation; use that with the ground lime, about one pound, I think, to forty pounds of lime. That is ground lime, I do not think it is air-slacked.

MR. FRIEND—It is dust lime—comes in sacks, about forty pounds in a sack, and is just as fine as flour.

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THE CHAIRMAN—Did he try this dust spray on tree fruits?

MR. RICHARDSON—I think he did not this year, although he has a young apple orchard of about ten acres, mostly Wealthy and Duchess. He used it on part of his grapes last year and he said there was a very perceptible difference where he used the dust spray. I have used the liquid spray, but I am going to try the dust spray next year.

MR. HARTWELL—I have heard so many conflicting reports in regard to the dust spray that I think the only way to test it is to have a scientist take hold of it and make check tests and I wonder whether Prof. Lloyd could not contribute something on that question. There is no question that the dust spray is the easiest thing to work with if it will get there. I have had seasons that I did not need to spray and it was the condition that was favorable rather than the spray and it may be that the favorable reports from the dust spray have been due to accident.

PROF. LLOYD—I was not intending to let this discussion go by without saying a few words. In the advertising matter sent out by the parties who have machines and materials for dust spraying, the good results reported are comparisons with dust spray and no spray, not comparisons of the dust spray with the liquid spray. Some persons in this State have had practical experience with the dust spray, notably A. A. Hinkley. For two or three years he advocated the dust spray at the State meetings. One meeting he was not saying much, the next year he was looking up the price of the power liquid sprayer. To get some accurate data on this subject, the Experiment Station undertook a series of tests, comparing liquid and dust sprays and no sprays. These tests were made under the direction of our Prof. Crandall, and were carried on for three years in two different localities in the State, and in every case the results were the same. These tests were all on apples. The liquid-sprayed trees retained their foliage to the end of the season, and the fruit was practically free from apple scab and apple blotch; the dust sprayed trees and unsprayed trees were alike in that the foliage dropped very early as the result of apple scab, and that fruit was exceedingly scabby; no difference so far as the effect of fungous diseases was concerned could be found between the unsprayed trees and those sprayed with the dust, while the liquid sprayed trees were in good condition. It seems that the dust application will to some extent control leaf-eating insects, and chewing insects in general, but it is ineffective with the materials that have so far been devised against fungous diseases. I would not advise anybody to adopt dust spraying for orchard operations.

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THE CHAIRMAN—We will do such a thing as shake a little hellebore on gooseberry bushes and perhaps you can call that dust spraying. On fruit trees, experiments have proved that it does no good, but for leaf-eating insects it seems to be effective.

PROF. LLOYD—This work has been published in a bulletin from the Illinois Station and it is available to any one that wants a copy, all they have to do is to send to the director of the Experiment Station for it.

MR. FRIEND—The next question is one that anybody can answer.

QUESTION—Why don't more people become members of this Society?

You can pay a dollar and you do not need to say a word.

QUESTION—We have a dozen apple trees about eight years old. They are winter apples, very large and hardy trees, and have never blossomed. Do you think they ever will?

MR. FRIEND—If they are eight years old, I think it is not exactly time for them yet. What varieties have you?

A LADY—They are Wealthys. Upright growers.

MR. FRIEND—Well, if they are Wealthys they should bear at this time. They are a nice shaped tree, very hardy.

THE CHAIRMAN—Sometimes people recommend girdling trees as a last resort, make a ring about the tree perhaps one-eighth inch wide, clear down to the hard wood, do that in June. But do not do that if you care much for your trees.

MR. HARTWELL—You might try it on a tree or two.

QUESTION—When and what to spray to prevent currant worms?

MR. HARTWELL—Paris green in any form.

THE CHAIRMAN—Put it on before you see the currant worms.

MR. SOVERHILL—Throw the spray on the ground, on the root portion, that prevents them entirely.

A MEMBER—Put it on before they blossom.

THE CHAIRMAN—After they get there, they do their work so quickly that it is a pretty good plan to put that on before they get there; put it on early.

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MR. SNELL—For spraying for currant worms, I much prefer the white hellebore. That is effective and it is safe, more especially where there are small children about. I have tried it with excellent results.

QUESTION—Is it better to plant the same kind of apple trees together or mix them with other varieties?

MR. HARTWELL—Mix them.

MR. RIEHL—When you say "mix them," there are two ways of mixing them. I would not mix them in the rows, but let them be a few rows apart, that is all right. The bees and the wind will carry the pollen. You want to be careful how you use that word "mix;" a person might get the wrong impression.

MR. SOVERHILL—I knew a body of trees of thirty acres that were planted right together, one body of Baldwins, and another plantation where they mixed two rows of Baldwins and two rows of Greenings. That small piece of ten acres bore more fruit than the thirty-acre piece did. For thirty years I have seen the practical working of this plan, and I would not advise any one planting a solid body of one variety.

QUESTION—How would you treat an orchard on hillsides?

MR. FRIEND—Now, this has reference, I suppose, to whether you would cultivate that orchard or mulch it. Somebody that has so much land that they have to stand it on end can tell us about that.

MR. RIEHL—I cannot answer that question for you, because I have land that is very rolling and that would all wash away with you, but our land does not do that. That may seem strange to you, perhaps. There in Alton we sometimes will cut straight through a bluff and it will be twenty and thirty feet high and stand there as straight as that wall, and you can see the pick marks there for ten years. You have not got such land as that here and consequently my experience is of no value to you. My land does not wash like yours.

MR. FRIEND—I would say, cultivate alongside the hill so that the furrows will not run up and down the hill.

MR. HEY—Suppose you have hills that slope both ways.

MR. FRIEND—Cultivate in a circle.

THE CHAIRMAN—They quite often leave a sod place between each row, where sod is, so as to prevent it washing down hill.

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QUESTION—When is the best time to trim grape vines?

MR. RIEHL—Just as soon after the wood is ripe in the fall as you can get at it, the sooner the better.

THE CHAIRMAN—Just as soon as the leaves fall.

MR. RIEHL—Yes, and before that; just as soon as the wood is matured.

QUESTION—Is the wooly aphis dangerous to trees?

GUY A. BRYANT—I would say the State inspectors think it is, when they inspect the nurseries they always look for the wooly aphis among other things, and those trees have to be destroyed. I think when a tree affected with wooly aphis is planted in an orchard, it will do very well for a few years, then die.

MR. HARTWELL—Would you recommend taking it out of the orchard when it is affected?

GUY A. BRYANT—I would, yes.

MR. HARTWELL—How about spreading to other trees?

GUY A. BRYANT—It is supposed to do that, I am not a horticulturist, I have not any experience in that line.

MR. BRYANT—I think that is the tendency, and when you want to take out a tree affected with that, put some dynamite under it.

MR. HEY—When the inspector was at my place, I asked him about the wooly aphis, and he said it was not dangerous in this part of the country, and if they do exist, they will not exist long; they will die out by themselves.

QUESTION—Some instructions on raising and preserving celery.

MR. KEITHLEY—Providence provided a season this year that was very good for celery, but if a man starts out to raise a little celery for his own use, he has to plan on doing the work that is necessary to be done at the proper time, the same as for strawberries and everything else. My method generally for planting celery in a small way is to make a long ditch with a one-horse ten-inch plow, opening the furrow as deep as I can; then throw the dirt out from the bottom of this trench below the surface of the ground; put in well rotted manure to the depth of two or three inches; put the soil on that and plant the celery plants eight inches apart, setting plants eight to ten inches high with some leaves on.

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I gather those leaves in my hand and get on my knees and press the dirt firmly around those small plants, as high up as I think it is necessary to cover them up to hold the leaves up, then I take my hoe and draw the dirt up to that. I do that as often as I have time to do it; the oftener that is done the better the celery will be. You cannot get the ground too rich for celery. This season after I had heeled my celery the second time, it left a ditch on either side of the row. Remember you have to use rotten manure, fresh manure will not do; it burns the celery up; use well rotted manure in these trenches and on either side I also scatter rotted manure.

The Auditing Committee reported that they had examined the Treasurer's report and vouchers and found them correct.

On motion, the report was accepted.

CARE AND HANDLING OF BUSH FRUITS.

O. M. McIlvaine, Bushnell.

We would class under the head bush fruits for Illinois, blackberries, raspberries, gooseberries, currants, etc. The first two I will talk about the most, for they are the principal market berries in our locality. There are at least 100 crates of either blackberries or raspberries sold in my neighborhood to one of currants or gooseberries.

Blackberries are very easily raised on most any of our Illinois soils, and there is no reason why every family should not have all of them they want. First, decide on the variety suited to your locality and yourself. Be sure they are hardy, for if they are not, no difference how good they are, they will be of little profit or satisfaction. Then prepare a piece of ground where you expect them to grow for several years, for if properly taken care of they will do well for a long time in one place.

The fall is the best time to plant them, but they will do about as well if planted in the spring. If they are planted in the fall the roots become calloused over where they are cut and will be ready in the spring to start new rootlets very early. Plant in rows about nine feet apart and three feet in row. Commence cultivation as soon as the ground is in proper condition in the spring. Cultivate deep in forepart of season. Later cultivate shallow and keep top soil fine. The harrow is the best tool for the later culti-

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vation. If you can spare the time harrow after every heavy rainfall. Do this as soon as the ground will crumble, thus conserving the moisture, for blackberries need plenty of it, especially in the fruiting season. Dust mulch is better and cheaper than straw; you always have the former on the ground while straw is worth money and is very hard to get in some locations. Straw is a harbor for mice insects and fungi, and prevents the ground from freezing, which is necessary to loosen our soil. If cultivated as has been directed, sprouts will trouble very little.

The bushes should be trimmed twice a year. The first season trim rather short. The second spring after setting, cut back to about three or three and a half feet high. Just before gathering the berries or just as the first berries begin to ripen, trim the new sprouts six or eight inches below the fruit. Use a pair of pruning shears in one hand and with the other take hold of the top and lift the part as you cut it off and drop it between the rows; they should be gathered up with a fork, loaded on a wagon or sled, hauled out and burned to destroy all disease and insects. Let me say right here that in setting out your bushes, there should be a space about every six rows, wide enough to haul either fruit or brush out. After you have trimmed the bushes take a look at the fruit. You will be surprised how easy it is to gather now.

After picking season is over the old bushes which have borne the crop and will soon die should be removed, although they may be left till spring as a protection from the wind, as it prevents breaking the new canes. Cut out all the small or weak canes. You can make a tool for doing this, from a section of a mower riveted into a pitch fork handle. Saw into the middle of the end the depth or width of the section and fasten with two rivets and washers, then grind the section on the side next to the handle in the shape of a hook. You can cut by pushing or pulling and you will find it a very handy instrument for the purpose.

Do not gather your fruit until it is ripe. Blackberries should stay on the bushes at least three days after turning black. Some need more time than this. Of course if they have to be shipped far they should be gathered a little firmer, but your local customers will use twice as many if they get them thoroughly ripened. They would rather pay for fruit than so much sugar.

Black Cap raspberries and the purple ones need about the same treatment and quite similar to blackberries. These should always be set in the spring and usually I have had better success getting them to grow by letting them get a few inches high before taking them up in the spring. Always use the tips. Cut all the old

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tips off and leave only the new growth and you lessen the danger of disease from old stock. Plant in rows about the same as the blackberries and use the same kind of cultivation. The first year they will grow rather sprawling on the ground, but the second year they will stand up all right.

If you do not want plants, trim rather late in the summer. Before cutting out the old bushes in spring trim the tops of the new and you can take them all out together. Also trim at fruiting time the same as blackberries. The black caps have been the most profitable in our locality. They handle better and the demand is much greater than for either purple or red. The season can be prolonged with any of the fruits by having early, medium and late varieties. The early and late usually sell at better prices than the medium, although the early varieties do not produce as well as the others.

The red varieties sprout so badly many people do not like to raise them. For canning purposes we like the purple better than either black or red.

Currants by some are prized very highly, but judging from the inquiry for them their friends are not very numerous. One thing in their favor, they can be used quite early, making fairly good pies and sauce when green. They are comparatively easy to raise when once started. I advise planting them 7x7 feet, nearly 900 to the acre. Cultivate till pretty well grown, cutting out all dead wood and occasionally thinning out the top. They can be started from cuttings, but you save much valuable time to buy them already started. Your market will determine the degree of ripening required.

For slugs use white hellebore dusted on the bushes when wet with dew. In gathering for market take the stems with the fruit.

Gooseberries, when properly grown, gathered at the right time, and cooked, are delicious if you have plenty of sugar and rich cream. Plant rows at least nine feet apart and seven feet in row. Let me say right here to all amateurs, arrange all your fruit and vegetable plantations so they can be cultivated by horse power; man power is too slow, high priced and hard to get, to compete with horse power. Of course you must have proper tools, but they are cheap in comparison.

Gooseberry bushes need thinning out to let in sun and air; by doing this the fruit will increase in size and quality besides being partially protected from mildew. For canning they should be gathered just before they have attained their full growth. They

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will then be tender and not quite so tart and still have the good flavor. When you want to gather them use a heavy pair of buckskin gloves and strip berries, leaves and all from the branches and then put them through a fanning mill or pour them from one vessel into another where the wind can blow out the leaves. This way of gathering will not hurt the bushes very much, not nearly so badly as it would your hands if you picked them without gloves.

It pays to spray all fruits.

Discussion of Mr. McIlvaine's Paper.

Mr. Hunt—I would like to ask what varieties of the purple raspberries Mr. McIlvaine grows.

Mr. McIlvaine—Well, we have had the Haymaker and the New Cardinal and the Columbian. I think that the New Cardinal is a good berry; it is not as large as the other, but it is very productive. It does not grow quite as large a stalk, but plenty large enough, and they are very good for canning, I think they are excellent.

Mr. Hartwell—Have you had any experience with the yellows on blackberries, the disease?

Mr. McIlvaine—I have had what they call the orange rust, not very much of it. I dig it out as soon as it appears and keep the bushes dug out. You can tell when a bush comes up in the spring whether it is affected. The leaves will be affected a little when they come out.

Mr. Soverhill—In regard to the trimming of blackberries and raspberries, you spoke about cutting off the young sprouts but once; would it not be better to cut them off two or three times, not let them get so large, but to get the young growth branching out soon?

Mr. McIlvaine—Yes, I do not think it pays to cut them more than a couple of times during the summer, you get too small laterals; if you get several good, strong thrifty stalks, there will be quite a good many laterals come out, and you will have large berries, and the fruit will be larger, and they bear just about as well as to cut them and make branches in several sections. That has been my experience.

Mr. Hey—What variety of currants do you like best?

Mr. McIlvaine—Well, we have what we bought for Pomona, the Red Cross and the Victoria, and I believe one or two others. I think the Red Cross is a very good currant.

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MR. KEITHLEY—I would like to ask how the Red Cross is for bearing.

MR. MCILVAINE—Well, it is not the heaviest bearer. We have one they call the Pomona, but I do not think it is the Pomona, because Mr. Riehl reports them as a very fine currant. Those we have in our rows are not very large, but they are very prolific bearers, rather small though. The Red Cross is only fair. There is a currant that we just got in our Station, the Perfection, I think that is going to be a splendid currant. We have not fruited it enough to tell much about it.

THE CHAIRMAN—Mr. McIlvaine is superintendent of the experiment station in the Central part of the State and does good work.

MR. HARTWELL—There is no question but that the Perfection is prospectively an excellent thing to plant, it may turn out different later.

MR. HUNT—I would like to ask if Mr. McIlvaine has ever tried tying red and black raspberries to wires on stakes.

MR. MCILVAINE—No, sir, I have never had time to do that. I have a neighbor that has set an acre or so, he will set posts every ten feet and stretch wires on either side of the berries and raise them above the ground that way. If they are properly trimmed, I do not think there is very much necessity of wiring them up.

MR. SOVERHILL—If the posts at the end are properly braced, one post every twenty to thirty feet will raise the wire on either side very nicely. It is very nice for cultivating and picking the fruit. It keeps everything off the ground clean and after it is once done, it is very little work. I practice that entirely.

MR. MCILVAINE—It would be well to put a strongly braced post at either end.

MR. HUNT—I had a plan that I intended to try if I had not quit raising red raspberries for the market that I believe would be a good thing and save a great deal in picking and handling the berries. That was to run two wires six or eight inches apart the whole length of the rows and then tie the last year's growth all to one wire on one side of the row; and the new growth, train it and tie it to the other side, and then you could pick all your berries from one side of the row and they would not drop down into the dirt if you were cultivating when it happened to be rainy or wet, and I believe it would save more time two or three times over than it would take to do it.

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MR. KEELER—I would like to ask Mr. McIlvaine if he is doing anything with dewberries.

MR. MCILVAINE—Not very much. We have a few that started this season. We never get anything out of them. They run over everything, they trip you up, they run over some places where we are not expecting them. I think the fruit is not worth propagating, it has the poorest flavor.

MR. KEELER—I tried them this year, and I thought they were the nicest fruit I had.

THE CHAIRMAN—I would not think of growing them again. They winter kill every year and they bear just a few scattering berries, and they are so thorny that they must be put on trellises, and as this gentleman said, they grow so long and trip a man every time he comes near and catches on them. There is much other fruit that can be grown much more easily and profitably than dewberries.

MR. DAVIS—I have a dozen bushes and I stake them up. I find it pays, they have been in about five years and I have not lost a bush. As you say, they are hard to handle, but if you have the time I think it pays. I grow the Lucretia and I think it is fine. We like them, we stake them in the middle and keep them up.

THE CHAIRMAN—Why do you grow them in preference to blackberries?

MR. DAVIS—Well, I have blackberries, too, and I might say that we get some dewberries when we do not get blackberries, and we like them in this particular, it is a much bigger berry. They are not as strong as some berries, but we think they are fine.

MR. HARTWELL—Do they go through the winter without protection?

MR. DAVIS—I have not protected them. The Lucretia is the only one I ever tried.

THE CHAIRMAN—A few plants are all right for a man to grow for his own use, but for the market I do not think it pays.

MR. DAVIS—Speaking of berries, we have had a great many red and a few kinds of black raspberries and we put two wires just a foot apart and I forgot, probably every fifty feet we put a post up with a cross on and a wire, and we could cultivate them right up close with a fine-tooth harrow and we had splendid luck. I

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think it pays to anchor them and run wires through. That is my experience with raspberries, and if we have them trimmed enough we do not have trouble with suckers.

MR. HARTWELL—How far apart are your rows?

MR. DAVIS—Our rows are seven feet apart.

THURSDAY—AFTERNOON SESSION.

CO-OPERATIVE SPRAYING.

L. R. BRYANT, PRINCETON.

Successful orcharding not only calls for spraying but for good care in other ways, pruning, cultivation, etc., and then sometimes we find that we have much to learn and also that the seasons are a factor which we cannot always calculate on with a certainty.

We spray apple trees to control insect enemies and fungus diseases. I wish I could say that we can always do this successfully. But we have not reached that point yet. One may spray this year and harvest a fine crop of apples, clean, bright and free from worms and other insects and then he thinks he has hit on just the right mixture and knows all about it. Next year with the same mixture and apparently the same conditions, the result is far from satisfactory. So, in spite of the experiences of thousands of fruit growers, supplemented with the work of scientists and experiment stations, the best ingredients to spray with, the number of times to spray and the right seasons to spray, are yet questions unsettled in the minds of many persons of large experience. Notwithstanding this, however, ninety-nine out of a hundred of the successful apple growers spray regularly and while they may not agree as to formulæ and the details of spraying they will agree that spraying is one of the essentials in orcharding.

Spraying is to some extent cumulative in its effects, i. e., a season's spraying is usually more effective in an orchard which has been sprayed for a series of years than in one where spraying is only occasional. Then again it is reasonable to think that where a sprayed orchard is surrounded by other sprayed orchards the results will be better than where the neighboring orchards are unsprayed.

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I am here to advocate the intelligent, regular and general spraying of farmers' orchards and fruit plantations. I believe it is practicable and can be done at a reasonable cost, and *how,* I will try to explain as briefly as possible. I take it for granted that all who are here know why we spray, that we spray with Paris green, arsenate of lead or some other form of an arsenical solution, for the apple worm, the canker worm and other chewing insects, and that we spray with the Bordeaux mixture for affections of the leaf and fungus affections of the fruit. It is the general practice to use the Bordeaux mixture and the arsenates in combination and the generally accepted formula until recently has been the 4-4-4 rule, i. e., four ounces Paris green, four pounds copper sulphate, and four pounds lime to fifty gallons of water, in three applications, one before blooming, one just as the petals are falling, and a third ten to fourteen days later. But some are advocating changes. One is that on certain varieties which rust badly the Bordeaux should not be used after the fruit forms, others yet advocate weaker solutions of Bordeaux and stronger of the arsenates.

One of the essentials in spraying is a good outfit and one reason why so many make a failure of spraying is that the attempt is made with a small pump or a "squirt gun" that is fit only to use on rose bushes and small fruit plants. It is necessary that the spray should reach all portions of the tree and that it be in the form of a fine mist and not in a stream. To do this, a pump must be used large enough and powerful enough to give a high pressure and even then, to reach the tops of large trees, the nozzles must be attached to long, bamboo-encased brass rods.

I want to impress this point very emphatically on your minds. Your pump must have capacity and power to do good work. You are throwing away time and money when you fool with a tin pump in an apple orchard. Besides the pump, the outfit needed is a fifty gallon barrel to set the pump in, ten or fifteen feet of good one-half inch hose, a bamboo-encased brass rod, a double vermorel nozzle, a fine wire strainer to strain the solution, a gallon measure and two barrels or tubs to prepare your mixtures in.

FORMULAS.

Directions for making and applying spraying mixtures are so common and generally accessible that perhaps it is not necessary to spend much time on formulas.

In preparing Bordeaux, make stock mixtures of both lime and blue vitriol, preparing enough at one time for that particular spraying. Weigh out the required amount of blue vitriol put it in a

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burlap sack and suspend it in a barrel containing one-half as many gallons of water as there are pounds of vitriol, hanging the sack so that it is just covered by the water. In twenty-four hours the blue vitriol should be dissolved. For the lime mixture, weigh out the amount of lime required, measure one-half as many gallons of water, use as much as is required to slack the lime, then add the rest of the water and run off and strain into a barrel or tub. Use one-half gallon of the solutions for each pound required by the formulas used. The standard mixture generally advised is four pounds each of lime and blue vitriol for fifty gallons of water, but the coming season I think I shall use for the second and third spraying three pounds of vitriol and five pounds of lime.

Having the stock solutions, to make the Bordeaux, have two barrels and strain the necessary amount of the vitriol solution into one of them and add sufficient water to make twenty-five gallons, in the other barrel place the right amount of lime and dilute to twenty-five gallons. Add the arsenates to the lime water before putting into the spray barrel. If Paris green is used put one-quarter pound in a large bottle, add a little water and shake thoroughly when it can be stirred into the lime. If arsenate of lead is to be used, add a little water and stir until of the consistency of paint. Thoroughly stir the contents of both barrels and pour at the same time into the spray barrel so that they may be well mixed. In spraying, give all the pressure possible so as to apply the spray in the form of a fine mist and see that all portions of the trees are evenly covered, but endeavor to stop before the tres drip much. If for any reason the mixture is allowed to stand for any length of time, it should be well agitated before commencing spraying again by pumping it back into the barrel for a few moments.

WHAT TO SPRAY.

It is not the apple trees alone that should be sprayed. Spray with the same mixtures, pear, plum, cherry and peach, only with the peach use the Bordeaux of only half strength. If the currants and gooseberries are sprayed soon after coming in leaf there will be little trouble with the currant worm, and other small fruits as well as grapes are benefited by the same treatment. A caution here. Spray no fruit when it is in bloom or as it is approaching maturity.

Potatoes are sprayed very rapidly with the aid of an attachment which covers three rows at a time and the same mixture applied faithfully will control the potato bugs and the affections of the leaf.

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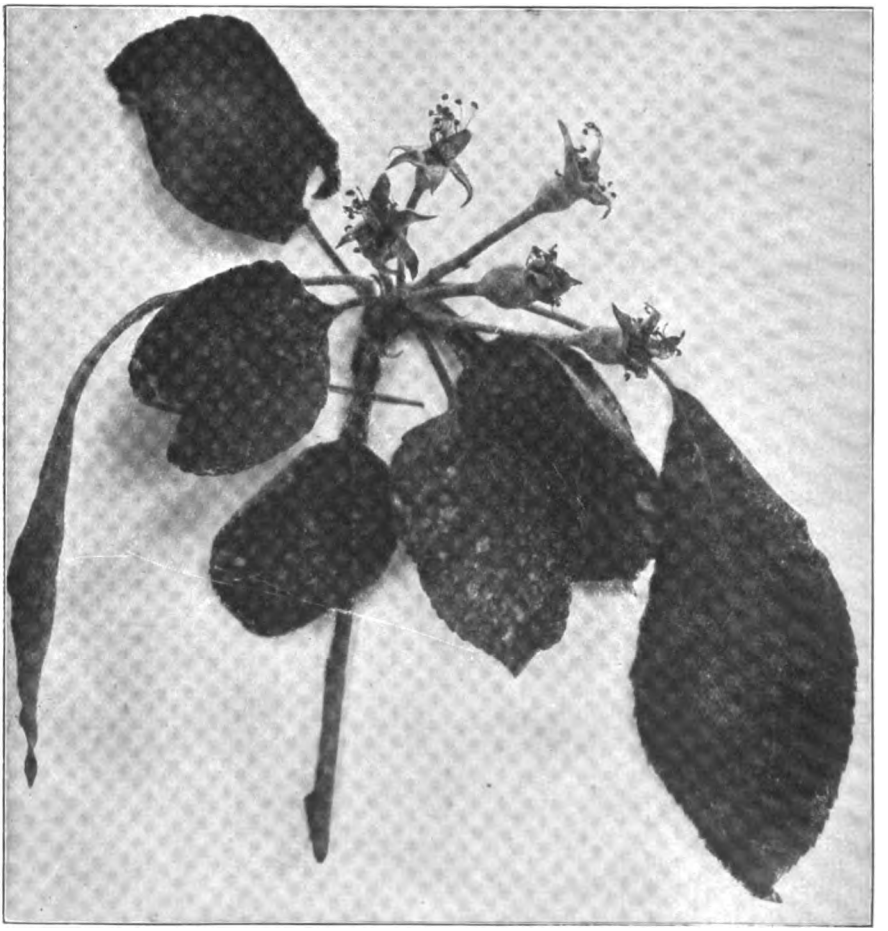

In spraying apples for the codling moth, it is essential that the application following the falling of the petals be made before the calyxes close. The calyxes of the different apples in the same cluster do not close at the same time. Those of the apples most advanced in development close first. These are the fruits most likely to persist and mature. It is important, therefore, that the spraying be timed with reference to the development of the most advanced specimens, rather than to the average development of the entire setting of fruit, or the belated specimens. In the above figure, the largest specimen has developed too far to be effectively sprayed; and the specimen at the extreme right, while still in fair condition for spraying, would be past that stage in one or two days.

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CO-OPERATION.

Many farmers dislike to invest in and care for such an outfit and still more dislike to bother with the making and applying of the solutions and mixtures and we often hear the wish expressed that there was some one with an outfit who could be hired to do their spraying for them. There would seem to be an opening in almost every community for some one to take up this work and make a business of spraying during the season, but one trouble with this plan may be this: Spraying to be effective must be done at certain seasons and at certain stages in the development of the bud, flower or fruit. A few days too early or too late may make all the work and expense of spraying utterly valueless and the owner of a custom outfit may be tempted to take more jobs than he can handle at the proper season, therefore I think the co-operation of half a dozen neighbors is the best solution of the problem. Let them all have equal ownership in the outfit, but let one person have sole charge of it, buy the necessary materials, make the solutions and apply them at the proper time, going the rounds and spraying whatever each one has to spray. In this way there will be but one job getting ready, the stock mixtures can be made for the half dozen as well and as quickly as for one and the whole work can be done in half the time that it would take for each one of the six to get the outfit and do his own spraying only, besides the advantage of having one person do the work who has had experience.

The stock mixtures can be carried right along in the wagon and the change from place to place made quickly. One important matter where there is much to do is a convenient water supply. The expense for material can be divided according to the amount of the mixture used and the time charged up to each one, to be paid for, or where help is scarce, work done in exchange.

This discussion is for those who raise some fruit but not in sufficient quantity so that they feel like getting a good outfit alone. I believe there are many such in this audience. I have been spraying more or less for more than twenty-five years and my first hints came from a man in your adjoining county, A. R. Whitney, one of the best and most practical of apple growers and horticulturists of his day. Have I convinced any of you of the necessity of spraying and the practicability of co-operation? If so, I urge you to act at once. Do not wait for your neighbor to start in the matter. Get right at it yourself. You can get a half-dozen of your neighbors to join with you if you push the matter now, but if you wait until it is nearly time to spray you will most probably do nothing.

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Spray your fruit then, in co-operation with your neighbors, do it thoroughly and understandingly and remember with spraying should go proper pruning, cultivation and good care generally.

Discussion.

The Chairman—I think Mr. Bryant did not give the name of this pump.

Mr. Bryant—I am not advertising this make of pump particularly, it is one which I handle somewhat, but it is the type of the pump that I am speaking of, some of the necessary features of it. As a matter of course, in commercial spraying the hand pump is considered out of date, that is, in very large orchards power pumps are used.

Mr. Bryant exhibited an illustration of the pump in question and explained the working of the different parts.

Mr. Soverhill—My objection to the custom-spraying is that the spraying perhaps should all be done in one day and that one person might get a particular advantage to secure a sprayer to do his work first and the others afterwards. Generally, with a common farmer's orchard consisting of fifty or one hundred or two hundred trees, with a suitable outfit he might go over four or five such orchards in a day; one man can do five or six men's work.

Mr. Bryant—My idea in having one man who had studied the subject, do the spraying, was he would start out and spray his own orchard that is ready, prepare his stock mixture, drive over to his neighbor's, and go the rounds.

Mr. Soverhill—Yes, do three or four orchards in one day.

Mr. Bryant—I see the trouble about the custom spraying that that that would be something like the thresher men that would pick up all the jobs they could early in the season and if there was bad weather, they would be delayed and before they got around it would be a little late. Some would be all right, but some would miss it. I think that custom idea is all right if it is carried out right, if you can only get your spray on at the proper season.

Mr. Soverhill—Mr. Dunlap explained to us a few years ago he had sprayed with the supposition that the blossoms would be out in a day or two, but cold weather came on and the blossoms did not come out and he started and sprayed again, the first spray was almost useless. The nearer you can get to the time of bloom, the better it is for the scab.

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MR. BRYANT—Of course that is true, but this is much preferable to getting some little thing that does not cost very much and does no good when you get it. Then there is another feature in regard to that, that if a man has only his own spraying to do and a few trees, he thinks. "Well, I had better get my corn ground ready," and puts it off a day or two, whereas, if he is also held responsible by his neighbors, they will get after him.

A MEMBER—Is it safe to spray any time during the day regardless of the weather? Speaking of doing four or five orchards, making an all day job of it, you have to do it in the middle of the day, is it best to do it then, does it cut any figure?

MR. BRYANT—I think not, I do not know of any reason. We spray in the right season, we spray one week, sometimes it gets so windy we cannot do it. If there is not too much wind, we spray; if we cannot spray against the wind, we spray one side and expect to spray again when the wind is the other way.

MR. MOORE—Do you think there is anything better than Paris green?

MR. BRYANT—The Paris green is used more than anything else, it is cheapest of any in general use. There are preparations of white arsenic which they say are cheaper. I have never used them, but there is I understand, more danger of burning the foliage and fruit. Arsenate of lead is coming into use a great deal, we have used it somewhat and think very favorably of it. The main objection to that is that it is more expensive, but Paris green has nearly doubled in price within two or three years.

MR. MOORE—It settles a great deal. I have had experience with it a great many years and the Paris green settles at the bottom and the agitator wants to go clear down to the bottom of the barrel.

MR. BRYANT—We do not find much trouble in that way, where the spraying is done soon after the barrel is filled and you keep it agitated. As I say, if you wait a little bit, stir it up, pump right back into the barrel and keep it thoroughly stirred; of course if the Paris green does settle it comes out first, and if you spray then onto your trees, you get it too strong at first and then too weak toward the last, but agitate it thoroughly and it will obviate that. We use a 200-gallon cask and instead of putting the barrel on the end we lay it on the side and with that we get the swash of the barrel a great deal, which helps, and in some cases this same pump can be put on the side, and the barrel laid down, if it is desirable.

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MR. SANFORD—Speaking of Paris green, I noticed a few parties last spring that advocated the use of Shields' green instead of Paris green, and I made inquiry of the druggists here if they knew anything about it, and they did not seem to know anything about it, and I had Mr. Thomas write to Chicago, to the United States druggists there, to ascertain if they knew anything about Shields' green and they did not know anything about it, so I wrote to the Fruit Grower of St. Joseph, Mo., asking where I could procure it, and they sent me the address where I could get it, and I sent and got a five or ten-pound parcel, and my experience is that it is very far superior to Paris green. It is very much more soluble, it will dissolve immediately. Paris green seems to have a certain greasiness about it, you have to take a small quantity in order to insure its being dissolved. The Shields' green seems to dissolve perfectly and will stay in solution, they claim ten or fifteen times longer than Paris green. I found it that way, it costs about the same, it is made by the same parties, but it is much finer and much more soluble, and I found it very far superior to Paris green. I would not use anything else.

MR. BRYANT—I never used that. There is a great deal of difference in the formulas of arsenates that are used and generally they are higher priced. There is this thing about Paris green, as I said, instead of trying to mix it up with water in a dish before using, put it in a large bottle or jug with a little water and agitate it thoroughly before you try to mix it in and we usually add it to the lime mixture before it is run into the spray barrel, stir it up thoroughly. It has that greasy nature, and when you use it, you want to put it into something that you can close up and shake thoroughly for some little time.

MR. SANFORD—In regard to the arsenate of lead, I think where Shields' green is used in connection with Bordeaux mixture, there has never been proved any advantage of the arsenate of lead over the green. We have tested it thoroughly, side by side, and we get just as good results from the Paris green as arsenate of lead when we use it together with Bordeaux mixture.

MR. BRYANT—We have not used it to such a great extent, but our little experience would seem to compare very favorably for the arsenate of lead, it does remain longer on the leaf.

MR. HARTWELL—I see in the Ohio Experiment Station report lime and white arsenic are recommended. I think the white arsenic has to be boiled for some little time to make the mixture. I think it is more work to prepare it in that way.

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MR. RIEHL—Just one suggestion I want to make about mixing Paris green. I have found the best way to do that is to take a half gallon Mason jar, put in Paris green and a small amount of lime, put it in there with water, and just give it a good shake, and it adjusts itself very readily, and it keeps it in suspension, and you can get it all out of the bottle clean. I think putting in the lime with the water is an advantage.

ELECTION OF OFFICERS.

The election of officers being next in order, on motion of Mr. Hartwell, the following officers were unanimously elected:

President, W. R. Soverhill, Tiskilwa; First Vice President, Guy A. Bryant, Princeton, Ill.; Second Vice President, L. H. Cutler, East Dubuque; Third Vice President, William Sanford, Polo; Secretary, Jacob Friend, Nekoma; Treasurer, Charles Hey, Dixon.

THE FARMER'S SHOW WINDOW.

JOHN W. LLOYD, UNIVERSITY OF ILLINOIS.

The show window is an important feature in modern methods of merchandising. We see it on all sides. In any progressive community, especially where the trade is sufficiently large to warrant the maintenance of stores carrying single lines, the show window is much in evidence. No matter whether the line is groceries, provisions, confectionery, clothing, furnishing goods, shoes, millinery, jewelry, drugs, hardware, or furniture, the show window is depended upon to a large extent to attract and maintain the attention of the purchasing public. Its chief object is to draw trade. It is an index to the progressiveness of the proprietor and an important factor in determining his financial progress.

The higher the class of trade to which the proprietor is catering, and the more exacting his customers, the greater is the attention given to the show window. The "tone" of a store is judged largely by the appearance of its show window; and this judgment is usually correct, for the show window has a reflex influence upon the character of the store. The man who maintains a good show window is almost compelled to keep the front part of his store,

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back of the show window, in an attractive condition; otherwise the contrast would be too great. The kerosene and molasses barrels are kept in the rear; the scrap box and sausage mill are behind the counter; the tin shop is in the basement. Work rooms and storage rooms for materials devoid of attractiveness are often essential to an establishment, but they are located in as inconspicuous a place as possible.

The elements which make up the show window are the window itself, the fittings or accessories, and the display proper. The window must be large, so as to afford room for an effective display and opportunity for it to be seen. The fittings or accessories are the receptacles or framework used to hold the display in place or the trimmings used to give the display a suitable setting. The display proper consists of fresh goods from the regular stock, arranged in an artistic manner.

The most effective show windows display only one or a few kinds of articles at the same time, but these are shown in sufficient quantity to produce an impression. A barrel of gum drops will attract more attention than twenty small samples of different confections. The purpose of a show window is not to display a sample of each of the different articles offered for sale by the store, but rather to present a pleasing picture representative of some particular line of goods to which the store gives special attention. The nature of the particular articles shown is less important than the general effect of the window as a whole and the impression it will produce upon the observer as to the character of the store in reference to both type and quality of goods and the character of its proprietor in reference to neatness and taste.

While the elaborate types of show window decoration are found mainly in the large city stores, where men are employed especially for doing this decorating, the progressive stores even in the smaller towns are not without opportunity in this direction. Even the country store can be made to present a much better appearance than it usually does, if the unattractive things are removed to the background, and attention given to the arrangement of the goods in the front part of the store as well as the window itself.

The farmer is both a producer and a merchant. His whole farm is his factory and store. In driving through the country we notice great differences in the appearance of farms, and judge their owners thereby. At some places, hog pens with muddy wallows occupy a position close to the road; at others, it is the barn yard and manure piles which greet the public gaze. The front

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yard may be treeless and unkept, and the chickens and ducks occupy the side porch. The hedge may be untrimmed, and the roadside weeds seven feet high.

Like the country store keeper, the general farmer is likely to have too many lines of effort to give much attention to the appearance of his place. He has no specialties, and hence sees no special need of advertising; from a business standpoint he can see no necessity of a show window. Too many farmers have insufficient pride to expend time and thought on matters which do not yield directly a financial return. Art for art's sake has no place in their program; and they do not appreciate the indirect effect of beautiful surroundings. Many farmers seem to think that because they cannot hire a landscape gardener or maintain a park commission, there is no use of their trying to improve the general appearance of their farms. They are like the country store keeper who cannot hire a show window artist, but must himself do whatever decorating is done. The country store keeper can have an attractive show window if he wishes; so can the farmer.

The farmer who makes a specialty of one or a few products, particularly if those be high class products commanding fancy prices, will need an attractive show window to properly advertise his business, and gain and retain the respect of the community and of his customers. The live stock breeder must maintain well kept premises and be prepared to entertain prospective purchasers. The producer of fancy fruits or dairy products must likewise have a place which suggests neatness at every turn. As in the case of the store, the higher the class of trade to which the man caters, the greater the attention which must be given to appearances.

I have said that any farmer can have an attractive show window if he wishes, and that a farmer producing high class products of a special kind needs to maintain a good show window for purposes of advertising. Now, in what does the farmer's show window consist? Everything in, on, or pertaining to the farm which can be seen from the public highway is a part of the farmer's show window.

The window itself is represented by the farm buildings, and the fields next to the road. The general character and arrangement of the buildings and fields has a direct bearing upon the possibility of maintaining an effective show window. If the buildings consist of forty little sheds scattered promiscuously over the place, it is exceedingly difficult to secure the proper setting for an effective display. It is like trying to make a display in a small

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window composed of 8 by 10 glass. The fields next to the road should be sufficiently large to command respect, and not appear to be mere patches.

The fittings are represented by the fences, the roadside, the plantings about the yard, and the paint upon the buildings; and are often more important in making up the picture than is the display proper. The state of repair of the fences is more important than the particular make; but uniformity in the fencing throughout the farm is a desirable feature. The condition of the roadside in reference to weeds has a marked influence upon the general appearance of the place. The plantings about the house should be effectively massed at the sides, with an open greensward in front. Clumps of trees should screen the barn and outbuildings from the house. Neatness should characterize the appearance of the lawn and all parts of the premises visible from the highway. The buildings should be painted. If, with the exception of the house, they are all of the same color, they will form a much more pleasing background to the picture than if each has a color peculiar to itself. They look more as if they belonged together.

In the farmer's show window the display proper will consist of typical specimens of his choicest product. In a small pasture near the house and road, the stock breeder will keep a few mares and colts, or a bunch of ewes with their lambs, or a band of yearling calves. The poultry breeder will display several pens of his finest birds in ample yards within view of the road. The seed corn breeder will plant a well-manured field along the highway with his very choicest seed, and give it extra care. The orchardist will give special attention to the pruning and general care of that part of his orchard which lies next to the road. The grower of fancy strawberries will be sure to have a plantation where it can be seen. In all cases, the field planted next to the road for purposes of display should be large enough to attract attention by reason of its size as well as the perfection of its product. The more uniform the field or the animals in the pasture, and the larger the field or the number of animals, the more attention they will attract.

The various features of the farmer's show window should be not only attractive in themselves, but should be so related to one another as to give the whole place a harmonious and substantial appearance. The size of the house and barn and the distance of the buildings from the road should correspond to the size of the farm and the type of farming.

Show window decoration is a fine art. Its practice is even more difficult on the farm than in the store, because of the greater space

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involved, the greater permanency of so many features, and the length of time required to produce the final effect. The art is perfected by observation and practice. Because a man is not as accomplished in the art as he would like to be, he should by no means refrain from doing his best to improve the appearance of his own place. As the fittings and display in the show window of the store are frequently changed, so can they be on the farm. The buildings will occasionally need a new coat of paint; the fence will need to be renewed; new plants may be added to the border near the house; the trees and shrubs will change in appearance as they grow. The rotation of crops will make changes in the display itself, as will also the growth of the lambs and colts.

Just as the show window of the store influences the character of the whole establishment, and serves as an index to the quality of the goods handled, and the thrift, progressiveness and standing character of the whole farm and reflect the character of its proprietor.

Discussion of Professor Lloyd's Paper.

Mr. Hartwell—We do not want to let that paper go without some notice. I want to say that is a timely paper, a little unique in its topic and one that we are ready to indorse, and it is excellently put. The farmer has learned that a pig with a curly tail is not the prettiest ornament in his front yard. There is one thing in addition to what the Professor has brought out, and that is the reaction on the man, it is building himself up and making him self-respecting, and thinking himself worth something more than the bare accumulation of money.

The Chairman—There is no doubt it is the aim that all of us are after, but we may have a different picture in our eye to build to. Some person may have a different ideal of a show window from the rest of us.

Mr. Moore—I am only sorry that there are not more of the young farmers present today to hear this article. It is a very good one and carries me back to the time when I started here some fifty-five to sixty years ago, and I think the front yard that my wife kept with her twenty-five to thirty varieties of roses and all the plants that she had were a lesson; I know it was a lesson to the surrounding farmers, for they used to come over for plants all the time and it made that neighborhood a great deal more pleasant and more beautiful than some of the other ones. And here I look around and I see all the old gray heads of our retired farmers and

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some of them have boys on the farm; some have not, some have rented their farms and on rented farms it is pretty hard to keep flowers in the front yard.

MR. KEITHLEY—I think it would be a good idea for some of these retired farmers to invest in some of our horticultural reports and send them to some of these progressive farmers who have not come here. It only costs a dollar for the report of this year and last.

THE PLANTING AND CARE OF TREES AND SHRUBS.

O. C. SIMONDS, CHICAGO.

This subject, broadly considered, includes all of Forestry, and a large part of Horticulture and Landscape Gardening. Forestry, which has to do with existing forests and our present supply of timber, with the growth of forests for the future, with the preservation of our water supply and water power, and with conditions affecting climate, is the most important of the three. In fact, I believe it is the most important subject to be considered by the people of the United States—more important even than the tariff or the currency, because upon forestry depends the future prosperity and happiness of our people. One might almost say that upon it depends our existence as a great nation. Horticulture, in so far as it has to do with trees and shrubs, is concerned with the raising of fruit. It is very important, its products in some sections of the country exceeding in value all other products of the farm. It is the subject with which this society is mainly concerned. Landscape gardening has for its object the preservation and development of the beauty of our country. "Our Country" includes the cities and villages as well as the open fields. This third topic is also of great importance since it adds greatly to our happiness. We love a beautiful country. Its mountains and valleys, its broad spreading fields, its stretches of water, its flowing rivers, its wide reaching elms, its forests of maples and pine, its sturdy oaks, its foliage borders fringing the streams, lakes and roadsides, and surrounding our homes help to make us patriotic. It is of the planting and care of trees and shrubs in connection with this third topic that my paper was expected to treat.

In creating beautiful effects with trees and shrubs, the first question to be answered is, "Where to plant?" I would answer, "Plant wherever there is room, provided you do not plant what will hide a desirable view, or what will make shade where sun-

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shine is needed." With rare exceptions, vacant land, that is land not covered with buildings, roads or walks, should always be growing something. Where space is needed for allowing distant objects to be seen, for sunshine or a breeze, the ground covering should be low, grass, flowers, vines or perhaps some cultivated crop, but where there is no desirable view, or where shade is wanted, we can have trees or shrubs.

The second question to be answered is, "What to plant?" To answer this, one should have in mind a picture or a series of pictures. Perhaps I should say that there should be two kinds of series, one for successive areas of land, and the other for successive years. These pictures will determine that in certain areas, as along the sides of highways, or as a background or setting for buildings, or on a hill or in a public square or park, we can have trees that will grow to be one hundred feet high. In other areas we could have trees that would grow to be twenty, thirty or forty feet high; and in still other areas we could have shrubs of varying heights. After selecting the outline that our plantations are to take we have still to choose the particular trees and shrubs to form those outlines. A few rules may be formulated to guide our choice:

1. The plants chosen should be hardy—such as will probably grow to a mature old age.

2. They should be suited to the soil and climate.

3. Those selected for one picture should harmonize with each other.

To illustrate the proceedings thus far outlined let us suppose that a certain highway is to be planted. This thoroughfare is sixty six feet wide and extends for half a mile from a slight hill at one end down through a valley to a rise of land at the further end. The highway commissioners have made a good commencement by building in the center on easy grades, a good road sixteen feet wide, and bordering this road with depressed grass strips. They have also taken care of the drainage and grading, so that the next step in the improvement is the planting.

A row of trees might be planted on each side of the road, or we might have groups of trees arranged on each side. The latter method will allow trees of different species to be used, thus permitting the kind to be adapted to the soil. It will also produce a more varied and beautiful effect. The high ground where we begin with our scheme of planting is rather light and sandy, so we will select sugar maples, and scatter them along the planting space with here and there a Norway maple, and perhaps a few oaks.

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As the road begins to descend, we find it bound on the left by a hillside, but on the right we look out over an extensive valley. Here we will let the oaks predominate at the left, but cover the ground at the right with wild roses, aromatic sumac, and further on, hazel-bushes, so that the view will never become obstructed. As we reach the valley where the soil is rich and deep and moist, groups of elms, lindens, swamp white oaks and red maples will be arranged, interspersed or surrounded with masses of viburnums, red-branched dogwoods, winterberries, Carolina roses and button-bushes. As the road ascends, near the farther end, we find it bordered by oaks, hickories, and hazels of nature's planting, growing from a clay soil. We cut a few of the inferior trees for views, and leave the rest undisturbed.

In this example the places have been determined, and the trees and shrubs selected for planting. The next step is to obtain the plants. They may be found on some neighboring farm, and had for the asking, or it may be necessary to buy them from some nursery. In the latter case, try to get them from the one who raises them. Do not buy from tree agents. Order from the nearest reliable nursery that has what you want, and employs good packers.

While the stock is coming, prepare the ground. It will not be necessary to add new soil as the trees have been selected with reference to the kind found where they are to be planted. Dig very large holes, and fill them in. Trees always do better in filled ground, than they do in that which has not been broken up. If the land is in sod, it would be well to plow the entire strip, as grass is a great enemy to newly planted things. When the trees arrive, take them at once to some friable land, near where they are to be planted, and heel them in. Nursery stock is often injured by being kept too long in boxes. After the plants are heeled in it will be safe to transplant them to permanent places any time within a week or ten days from the time of their arrival.

It seems unnecessary to give details of the actual operation of planting to an audience like this, but I find that tree-planters are sometimes careless, so will mention briefly some points to be observed.

Do not let the roots get dry. This is important with all plants, but especially so with evergreens.

Trim off broken or bruised roots. The roots of a tree ready for planting, should end in smooth cuts.

In planting, have the hole large enough so that the roots can take a natural position. Place the tree as high as, or a little higher,

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than it stood in the nursery. Fill in the spaces between the roots with good friable soil packing it well. After they are well covered, press the earth down well with the foot. Sometimes, it is well to settle the earth about the roots with water. The usual rule is to trim the tops to correspond with the roots. Confine the trimming, however, to a portion of last year's growth. It is a mistake to cut a tree to a bear pole, or to cut back large limbs. The last bud left on a branch that has been trimmed, should point in the direction you wish to have the limb grow. A newly planted tree may be allowed to lean slightly toward the prevailing wind. When rather tall or slim or exposed to winds, it should be staked, or if very large, should be wired. In any case, the fastenings should be made in such a way as not to girdle or injure the trunk. It is generally better to screw an eye into the tree for fastenings than to put anything around it. Sometimes trees will need protection from animals. There are wire guards designed for this purpose.

Let us suppose that we have our trees and shrubs all properly placed and planted, so that in a few years, when they become established, it would seem as though nature had done the work. "What further should be done?" The best treatment is to keep the ground hoed and raked to prevent the loss of moisture, in other words to keep it in the same condition that a good farmer keeps his cornfields, or a fruit grower his orchard. If for any reason such treatment cannot be given, it would be a good plan to mulch the ground, using for this purpose, leaves, straw or coarse manure. Grass-cuttings are sometimes used, and are good, provided too many are not put on at one time so as to cause heating. Hard coal ashes are also recommended. Aside from trimming at the time of planting, no further trimming will be required for some years. As the trees grow, the lower limbs should be removed for convenience. The limbs never should obstruct those wishing to use the highway for going, or conveying produce from one place to another. Dead limbs should always be cut off. These sometimes come from disease, which may spread to other parts of the tree, or from shade and other causes. The ground about the shrubs should also be hoed, but usually the hoeing need be continued only three or four years, after which both trees and shrubs should take care of themselves. Do not trim up the shrubs and do not shear off their tops. If shrubs are planted close enough together to give a good effect the first or second year, they will need thinning the third or fourth year. Occasionally it is necessary to prevent a shrub from growing above a certain height. In this case it can be controlled by cutting out the stems of longer growth at some point in the interior of the bush. This method will preserve the natural shape, and allow flowers and fruit to grow. If trees are planted on the lawn, they look best

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when all of the limbs are allowed to grow. It often happens that people plant too many trees, and plant them too close to the house, so that the latter gets too much shade. In such cases, it is better to take out some of the trees, than to trim them all up. One large tree, with branches spreading perhaps fifty feet each way from the trunk, is worth much more than a dozen trees occupying the same space. If we do not give the trees room in which to grow, we shall never get the best specimens.

In planting, as has often been said, "Nature is the best teacher." We should notice how she fringes woods, and borders water courses and other open spaces. This will teach us how to bound the lawns about our houses, and the open spaces in our parks. Notice also the most pleasing highways. The planting effects of these are generally the work of nature. As you walk or drive through the country, or as you look out of car-windows, notice nature's method of grouping. Usually you will find colonies of a given species, for instance, if there is one hickory, you will be apt to find several hickories near it, or you will find many lindens together. The younger ones will probably be the children of the oldest. Or you will find a great mass of sumacs, hazel-bushes, elderberries, viburnums or dogwoods. The best effects are generally those formed by a few species.

When trees and shrubs are growing well and looking contented and happy do not worry them with too much attention in the way of trimming and cutting, but spend some time in admiring and enjoying them.

Discussion of Mr. Simonds' Paper.

Mr. Hartwell—Is your idea in planting the tree a little higher than it stood in the nursery that it will settle to its normal depth?

Mr. Simonds—Yes, of course there should be some loose ground under the trees and that will always settle. It may take two or three years to settle and the tree does not look well and it is not really well for a tree to stand in a hole. You will find that any tree along the road grown naturally stands a little above the ground.

Mr. Hartwell—I attended a convention in Iowa where this question was discussed and they were unanimous there in regard to putting the tree six inches higher than it stood in the nursery. That was to give it strength, and as they thought, free it from damage, possibly. Now the problems here are possibly different from what they would be somewhere else.

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MR. SIMONDS—Perhaps you have noticed in places where large trees have been planted that the ground is settled and they stand in a hole. It gives them an unnatural look. The feeding roots of the tree are out some distance from the trunk and out at a point perhaps at the end of the branches would be where they would get most of the food, and that would be a point that you would want to have sufficiently moist, so that I think if the water is shed a little from the trunk of the tree and goes out to where the feeding roots are, it is really better for the tree.

MR. HARTWELL—I hope every one who has a tree to plant will observe one thing that Mr. Simonds has said that I have been trying to emphasize, and that is to get a sufficiently large hole to put your tree in. If the tree roots can be swabbed into a little hole, they will go, and that is the end of it. I cannot get people who get trees of me to understand that that is not the proper thing to do.

MR. SIMONDS—Let me give just an instance right in that connection. They wanted to replace the trees on Commonwealth avenue at Boston, and Mr. Pettigrew, the Superintendent of Parks there, planted a row of elm trees. The trees planted were not over two inches in diameter, I think not over one and one-half inches, little trees, but the holes made were twenty feet square and three feet deep.

MR. SANFORD—What is the objection to shearing? I admire the appearance of sheared shrubbery.

MR. SIMONDS—Well, there may be a little difference as to our idea of what looks well. To my mind, a tree or a shrub that is grown naturally looks really better than one that is sheared and looks a great deal like a haycock. Then there is another thing, when you cut off the branches you cut off the blossoms to a large degree and cut off the fruit. I like to have a little more of variety.

THE CHAIRMAN—I would like to ask Mr. Simonds what particular tree are they planting the most in the cities, along the streets and parks?

MR. SIMONDS—Oh, I should say that the elm is a favorite tree to plant in cities. If we had no smoke, that would undoubtedly be the favorite tree, but the leaves of the elm are a little rough and where there is smoke, it is best to select a tree with smooth foliage, so that the rains will wash off the smoke as far as possible.

MR. HARTWELL—Here is a question I would like to have you answer. There are a great many homes around in this country

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that are surrounded with large soft maple that are likely to break down, and the proprietors of those homes are dehorning those trees and leaving the stumps and they are very unsightly. What can be done with that kind of thing?

MR. SIMONDS—I do not know, Mr. Hartwell, they should be cut out. It is a great deal better to do that. I have seen that often and it always vexes me to have any one cut off trees in that way. And let me tell you the result, if you take soft maple and cut off the top in that manner, decay will set in. It is just as well to cut them off. The tree will send out some sprouts around where you cut it perhaps and may grow, while otherwise, for six or ten years that decay is going on and by and by the wind comes along and breaks that top right off and destroys the tree, destroys the beauty of it at least.

MR. DAVIS—Would you please name the two best trees for streets sixty feet wide, taking into consideration the width of the street?

MR. SIMONDS—Why, my prejudices, perhaps my affections somewhat are with the elms and sugar maples. Go to the woods here, test the best tree in your woods; elms and maples, and oaks and lindens in this locality would be good trees.

MR. DAVIS—Linden does not last here. Take an elm, is it not true that in order to have a nice tree, it wants to be left alone?

MR. SIMONDS—It should have room to grow.

MR. DAVIS—How can it get it on a sixty foot street?

MR. SIMONDS—Your houses are generally a little distance back from the sidewalk.

MR. DAVIS—I know, but our trees are usually set eight feet from the lot line. Now, put a row on each side, is not there something that you could suggest that would be better? They get too tall and too wide, that seems to be one objection.

MR. SIMONDS—I have in mind a street in Quincy, Ill., that is sixty-six feet wide, with trees planted on each side reaching over, sometimes lapping a little possibly, so that there is an archway of branches over that street, and it is really a beautiful effect.

MR. DAVIS—There is not a nicer street in the country than in Rockford, running north and south from Main street.

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MR. SIMONDS—The trees, of course, should not be close together. People are apt to plant trees ten to fifteen feet apart because they are small, and it does not look very close, but in planting they should be fifty to seventy-five feet apart.

MR. DAVIS—One to a fifty foot lot, what do you think of that?

MR. SIMONDS—That would be very good. Then there is one tree that we neglect that we should plant. We neglect our oak trees and they are really beautiful trees; they are more beautiful in foliage than the elm. The pin oak is a native in our country. I think it would be perfectly hardy here.

MR. WATERBURY—I am quite stuck on the catalpa for a roadside tree. You can make it any shape you like. It has a beautiful foliage and the flowers in the spring make as fine a looking sight as you can see, and there is nothing that will injure it in the way of stock that I know of.

A MEMBER—I have had them blossom after the Fourth of July, and I had one struck by lightning and that did not kill it.

MR. SIMONDS—I think there are places for the catalpas; they have beautiful flowers; they drop their leaves very early in the fall.

MR. WATERBURY—Often they hold their foliage as late as any, this season mine did not. Another thing about the catalpa, the wood is valuable for posts, it is quite a rapid grower.

MR. HARTWELL—What do you say of the Norway maple?

MR. SIMONDS—It is a beautiful tree, grows in poor light soil, leaves out early in the spring. It colors a rich yellow in the fall and it holds the leaves perhaps as late as any tree with the exception of some of the willows.

MR. HARTWELL—Is it not a little more rapid growth than the sugar maple?

MR. SIMONDS—About twice as fast.

MR. RIEHL—I want to differ there, it does not grow fast with us.

GUY A. BRYANT—I want to speak a word for the sugar maple. With us it grows as fast as the Norway maple. We are on black soil.

MR. SIMONDS—We have at Chicago a light sandy soil and we have planted sugar maples and Norway maples and there the Norway maples have grown twice as fast as the sugar maple.

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THE CHAIRMAN—I would like to ask Mr. Simonds what he would advise a farmer to plant that was going to plant to forestry?

MR. SI IONDS—Well, I would not confine myself in that case to one tree, I think that in Northern Illinois he could make his choice from elms, maples and ash.

THE CHAIRMAN—For profit that is, for planting to eventually get money out of it, for forestry and for farm use?

MR. SIMONDS—Well, he would want some lumber and he would want perhaps some fire wood and posts. Catalpa has been spoken of, that is a very durable wood, and I believe there are places where it could be raised with great profit. I planted some on a new place I have in Michigan and it grows about an inch a year. The locust would be good if it were not for the borer, if we can keep the borer away there is no tree more durable than the locust. White oak is a good tree, at least it is a good tree in Oregon, and I should think it would be good here. The burr oak is a good tree. I have seen an oak tree make a growth of six feet in a year.

MR. MOORE—That is a most excellent paper, but it did not touch on the trees that the farmer ought to plant for commercial or for home use. As many of you know, I have planted a great many trees; the first planting I did was in 1873, setting out 35,000 European larch in a plantation, four feet apart. I got yearlings from Douglas at Waukegan. If I were going to plant any kind of tree, I would not plant a tree older than a year; that I can set with a spade, then I can trim it as I want it, and transplant it as I want to. Then I set out 2,000 white elms, slippery elms, I set those out five feet apart. Those European larch grew splendidly for a year or two. It is pretty hard work to start a plantation and cultivate, because they make a bushy top and lap over after a year of two until they get a sart, then they go up like a lightening rod. Well, they commenced dying and what was the matter with them I did not know. I went down to Champaign and got Prof. Forbes, I got Samuel Edwards and Whitney and they came over and dug up and sawed lengthwise and crosswise and could not tell what was the matter; they told me they found no fault with them, still they were dying at the top. In a couple of years more they stopped, a great many of them died out, but of those trees I still have some on my farm and a man has been cutting lumber out of them, got 10,000 feet out of those trees, which are about sixty to seventy feet high, and they are the best timber that a man can have to make a shed or barn of; they would not last in the ground. Samuel Douglas fooled me on that proposition. He said the docks at Liverpool

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of European larch had been there two hundred and fifty years and they were still sound. He showed me a section of tree that was on the mountains in Scotland and it was as black as mahogany. Cut a section out of our larch and you can run a knitting needle through the spores on the timber. Those European larch are getting their resinous wood in the heart and the sap is not more than an inch and a half thick and the balance is getting all right, so that I think after a while we will have wood that will last. It holds a nail better than any timber, it will support more weight for the size of it than anything else. They put them up forty feet long in bridges. Well, I set out next year 12,000 white ash. I made a mistake, they have not grown as I expected them to. If you want a timber for posts, I would advise you to set out the osage orange, set them out four feet apart, then you will get the upright growth. Go through them when it is necessary after they get to be three or four or five years old—they may kill down the first winter—and cut them out; they will sprout out, cut out two-thirds, want a timber for posts, I would advise you to set out the Osage orange when I set out those larch trees, I could have gotten $250 worth of timber from every acre I have there. Those posts are worth fifty cents apiece, seventy-five cents, because no man will live long eonugh for an Osage orange post to rot. There are some that are not bigger than my arm that have been driven in this country for twenty to thirty years and they are just as sound as when put in the ground. Well, I set a lot of white pine, 2,000 I think. Set them thick. They grew right up. They are from seventy to eighty feet high. I set out the Norway spruce and the Austrian pine and the Scotch pine, which no man wants to fool with, the longer they live the uglier they grow, like a good-for-nothing. They will die in a little while. I set about 10,000 to 15,000 of the soft maple, I do not know how many, four or five acres. Now, that has paid. You can go and cut wood out of it, it is not the best kind of wood, but it will burn quickly.

MR. SIMONDS—I think all of those trees that have been mentioned are good trees and I would especially advise a white pine where the soil is light, as it is in the region of Oregon, naturally, there is pine forests, and that indicates that the white pine will do well.

MR. MOORE—Then I set about 500 catalpas out, and those trees will make six or eight or ten posts to the tree, good ones, and I do not agree in regard to setting them out along the road where you want anything beautiful, for they do not grow in any kind

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of shape. The flowers are beautiful, but it is a little hard to keep the tree in the place where they ought to be. They are like some men.

MR. HARTWELL—I wish every young farmer could read the paper that was read on this subject.

MR. MOORE—It is good for cities and parks and beautiful streets; it is excellent, and if you want a living representation of it, go to Lowden's farm, beyond Oregon. He sets out three or four thousand trees each year. He is going to have the most beautiful place west of Chicago after a little while.

AMOS F. MOORE—Douglas did not fool my brother half so bad as he fooled this Association. At Aurora he got them to pass a resolution some forty years ago that the European larch was the best tree for the farmer to plant. I went home and cut down a European larch, took it to the Illinois Central road, got the section boss to put it between two oak ties which looked like very soft ones. The Illinois Central got the idea that it would last for them as a tie, and they did not charge any freight for carrying European larch on their road. I put that tie in between two oak ties and in four years and eight months that tie was rejected, would not hold a spike; the oak stood five or six years after that, good white oak. That is where we got the idea to plant larches. I believe my brother got it there.

MR. BRYANT—I want to ask Mr. Moore if they had taken the European larch of the same age as the oak how would they have compared? If you are taking European larch of a quick growth, it may be largely made up of sap material, and to get anything durable in that line I think you have got to have the age to it. I do not think that is a fair test.

MR. MOORE—That specimen of European larch that Douglas showed that was grown in the mountains in Scotland, you could not see the annual rings, they were so close together. It must have been over one hundred years old and was not a foot in diameter, and ours in thirty to thirty-five years would produce one as large as that in diameter. Now those larches are making resinous wood and they will last longer.

MR. MCILVAINE—I wanted to ask whether the black locust was always troubled in every locality with borers.

MR. SIMONDS—No.

MR. MCILVAINE—Across the road from me my neighbor had trees—I had a forty-foot windmill, and I put it up to sixty feet,

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and still they are higher. One is about two and one-half feet through in the body and is perfectly solid, and apparently not troubled at all with the borers. My neighbor cut out quite a number and split them into posts and they were perfectly solid, sound and nice, and I do not know of anything that lasts better. Fence posts of locust that were cut twenty-five years ago are still in the fence and are sound.

MR. SIMONDS—They are in a locality where the borers do not affect them.

PREMIUMS AWARDED.

CLASS I.—APPLES.

Collection not less than 10 varieties—S. G. Soverhill, first.

Four varieties winter for market—S. G. Soverhill, first.

Four varieties winter for family use—S. G. Soverhill, first.

Four varieties late fall—S. G. Soverhill, first.

Plate new, good enough to recommend—S. G. Soverhill, first.

Plate Ben Davis—S. G. Soverhill, first.

Plate Grimes Golden—W. S. Sanford, first; S. G. Soverhill, second.

Plate Minkler—C. Hey, first.

Plate Salome—S. G. Soverhill, first; J. L. Hartwell, second.

Plate Wealthy—S. G. Soverhill, first.

Plate Wolf River—Geo. A. Hunt, first.

Plate Snow—S. G. Soverhill, first.

Plate Winesap—S. G. Soverhill, first.

Plate Willow Twig—S. G. Soverhill, first.

Plate Pewaukee—S. G. Soverhill, first.

Plate not named in list—S. G. Soverhill, first; C. Hey, second.

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CLASS II.—PEARS, PLUMS AND GRAPES.

Plate Kieffer—Mrs. Hey, first.

Plate Lawrence—Geo. A. Hunt, first.

Plate not named in list—Geo. A. Hunt, first and second.

Display of Plums—Mrs. Hey, first and second.

Plate White Grapes—Mrs. Hey, first.

Plate Black Grapes—Mrs. Hey, first.

CLASS III.—CANNED FRUITS.

Display of canned fruits—Mrs. Hey, first; L. H. Cutler, second.

Jar Tomatoes—Mrs. Hey, first.

Jar Strawberries—Mrs. Hey, first; L. H. Cutler, second.

Jar Black Raspberries—L. H. Cutler, first; Mrs. Hey, second.

Jar Red Raspberries—L H. Cutler, first; Mrs. Hey, second.

Jar Cherries—Mrs. Hey, first.

CLASS IV.—VEGETABLES.

Display of Vegetables, thirty-seven kinds—C. Hey, first.

Display of Potatoes—C. Hey, first.

Half Peck Early Potatoes—A. T. Keithly, first; S. G. Soverhill, second.

Half Peck Potatoes Winter Use—J. L. Hartwell, first; A. T. Keithly, second.

Half Peck Onions from Seed—C. Hey, first.

Half Peck Turnips—S. G. Soverhill, first; J. L. Hartwell, second.

Half Peck Beets, Table Use—C. Hey, first.

Half Peck Sugar Beets—C. Hey, first.

Half Peck Parsnips—C. Hey, first; S. G. Soverhill, second.

Half Peck Short Carrots—C. Hey, first.

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Half Peck Long Carrots—C. Hey, first.

Winter Squash—C. Hey, first.

Three Heads Cabbage—C. Hey, first.

Three Heads Celery—A. T. Keithly, first; C. Hey, second.

The following report of the committee on final resolutions was read and adopted:

FINAL RESOLUTIONS.

Polo, Ill., Dec. 5, 1907.

WHEREAS, The Forty-first Annual Convention of the Horticultural Society of Northern Illinois has exceeded the expectations of its promoters in the complete and very satisfactory local arrangements made for the meeting; and

WHEREAS, The able, interesting and practical addresses and discussions presented at the meeting have added largely to the fund of general information along horticultural lines; and

WHEREAS, The large and appreciative audience at each session has demonstrated the deep interest in the work of this Society, and gives great encouragement for the enlargement and continuance of the same; therefore, be it

Resolved, That the thanks of all in attendance are due and hereby extended to the local committee, the citizens and musicians of Polo for the perfect arrangements made for the meeting, and the generous hospitality extended to visitors.

Resolved, That the speakers who have contributed to the success of the meeting by the able and interesting addresses are entitled to a full measure of gratitude and our highest esteem.

Resolved, That the large attendance and many delightful new acquaintances made at this meeting will greatly prolong the pleasant memories of the Polo convention.

Adjourned.

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PROCEEDINGS

OF THE

THIRTY-FIFTH ANNUAL CONVENTION

OF THE

HORTICULTURAL SOCIETY

OF

CENTRAL ILLINOIS

HELD AT

Knoxville, Ill., November 19 and 20, 1907

Reported Under Direction of
W. B. LLOYD,
Secretary State Society.

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OFFICERS FOR 1908.

PRESIDENT.....H. AUGUSTINE, Normal
VICE PRESIDENT.....JESSE PICKREL, Knoxville
SECRETARY.....J. B. BURROWS, Decatur
TREASURER.....C. G. WINN, Griggsville

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CONSTITUTION.

ART. 1. This Association shall be known as the Horticultural Society of Central Illinois.

ART. 2. It shall embrace the counties of Adams, Brown, Cass, Champaign, Christian, Coles, DeWitt, Douglas, Edgar, Fulton, Ford, Iroquois, Hancock, Henderson, Knox, Logan, Livingston, McLean, McDonough, Mason, Marshall, Mercer, Menard, Morgan, Macon, Moultrie, Peoria, Pike, Piatt, Sangamon, Shelby, Schuyler, Scott, Stark, Vermilion, Tazewell, Warren and Woodford. (38.)

ART. 3. Its object shall be the advancement of the science of Pomology and the art of Horticulture.

ART. 4. Its members shall consist of annual members paying an annual fee of one dollar.

ART. 5. Its officers shall consist of a President, Vice-President, Secretary and Treasurer.

ART. 6. The President and Secretary may call meetings of the Society at such time and place as they may think will be for the interests of the Society.

ART. 7. This Constitution may be amended at any regular meeting by a two-thirds vote of the members present.

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LIST OF MEMBERS.

Life Members.

Augustine, A. M.....Bloomington
Augustine, H.....Normal
Brown, W. H.....Canton
Blair, J. C.....Urbana
Buckman, Benj.....Farmingdale
Buckner, J. E.....Decatur
Burrill, Prof. J. T.....Urbana
Burrows, J. B.....Decatur
Charles, G. A.....Knoxville
*Coith, Robert.....Normal
Dunlap, H. M.....Savoy
Evans, H. T.....Knoxville
Farron, J. A.....Griggsville
Felmley, Josh S.....Griggsville
Fisher, Mrs. Carrie E.....Macomb
Foster, George J.....Normal
Graham, R. O.....Bloomington
Hamilton, J. M.....Rantoul
Heinl, F. J.....Jacksonville
Hubbard, L. G.....Urbana
Hubbard, Fred C.....Urbana
*Johnston, James T.....Warsaw
Kriebel, D. S.....Springfield
Lake, George L.....Williamsville
LaRosh, S. D.....Pekin
Lambert, Dr. J. R.....Coatsburg
Losbury, M. N.....Griggsville
McElvain, O. M.....Bushnell

*Deceased.

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Moore, C. H.....Clinton
Pennell, F. W.....Danville
Poland, B. J.....Danville
Rode, J. H.....Clinton
Rook, Charles W.....Quincy
Simpson, Wm. N.....Farmington
Singer, E. J.....Peoria
Smith, D. W.....Springfield
Smith, F. D.....Camp Point
Snyder, J. F.....Cornell
Standish, Dr. J. V. N.....Galesburg
Stickle, A. R.....R. R. No. 2, Macomb
Stone, James A.....Bradfordton
Walker, William L.....Odell
Weld, Edward, Jr.....Clinton
Whitnell, C. W.....Peoria
Whitnah, Chester L.....Canton

Annual Members.

Brett, C. N.....Knoxville
Campbell, O. L.....Knoxville
Clay, H. H.....Galesburg
Foster, George J.....Normal
Gottrick, J.....Knoxville
Howard, Miss E. P.....Knoxville
Huggins, H.....Knoxville
McKawn, C. W.....Knoxville
Pickrel, Jesse.....Knoxville
Reasoner, J. R.....Urbana
Smith, C. E.....Knoxville
Standish, J. V. M.....Galesburg
Winn, C. G.....Griggsville

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PROCEEDINGS

OF THE

THIRTY-FIFTH ANNUAL CONVENTION

OF THE

Horticultural Society of Central Illinois

TUESDAY—MORNING SESSION.

The thirty-fifth annual convention of the Horticultural Society of Central Illinois was held in the City Hall, Knoxville, Knox county, beginning November 19, 1907. President Henry Augustine presided.

The session was opened with prayer by Rev. Watson.

The Society was welcomed to Knoxville by J. S. Simpson, the Mayor, in the following address:

Mr. Chairman, Members of the Horticultural Society of Central Illinois: Fortunately or unfortunately as the case may be for me, owing to my official position I have been put forward to perform the very pleasant duty of extending a welcome to you this morning.

We feel highly complimented in that, after holding your thirty-fourth annual meeting here, you have returned to hold the thirty-fifth session with us.

I have often felt that these addresses of welcome were, to use an old expression, more honored in the breach than in the observance, because so many times some fellow like myself is brought forth to deliver them that knows but little of the purposes of the

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meeting. I'll admit that I can hardly tell a pear tree from an apple tree, and I know I cannot tell a plum tree from a prune tree. But it is in the desire that our people who are and should be interested in these things may have an opportunity to learn from the gentlemen who you have brought here to address us that we extend to your Society a cordial greeting. If you can teach us how to increase the fruits of our orchards and tell us when to spray our currant and gooseberry bushes so that we can have some fruit in place of nothing but bare stalks left long before fruiting time, then will we consider you benefactors as well as guests whom we delight to honor.

As to the value of the products of the orchards, vineyards, etc., in the cultivation of which your organization is interested, I am not able to state, but I know it reaches up into figures that the ordinary individual is not able to comprehend. But far surpassing the commercial value is the benefits derived from having plenty of them so that every family can have an abundance of these the greatest health-giving foods that an all wise Creator has furnished for the human family.

The past year has been one of some discouragement for the Horticulturalist as I see by the agricultural report of the government, given out on the tenth of this month, that the production of apples in Illinois this year was but twelve per cent of a full crop as against eighty-four per cent in 1906 and thirty-one per cent in 1905, and that the average for the past ten years was forty-nine per cent of a full crop.

The estimated average for the whole of the United States this year is 31.1, and that for the past ten years is 52.5 per cent. So we find that your general average for the past ten years is so near that of the whole country that you have every encouragement to press forward in your work of educating the people how to grow more and better fruit.

And to the lady on this program I wish to extend an especial welcome, not only because she seems to show up as an oasis in a desert among this list of names, but on account of the subject she has chosen—that of Home Making—for if we as a people and a commonwealth are to go forward increasing in wealth, enterprise and intelligence, it will be through the influences of those coming from that God-given institution, the home—the Christian home. Again to the members of this Society and to all who may meet with you, I do on behalf of the citizens of Knoxville extend a cordial welcome.

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RESPONSE TO MAYOR'S WELCOME.

In behalf of the Society, George J. Foster, Normal, responded to the Mayor's welcome, as follows:

Mr. President, Citizens of Knox County and Fellow Members: We have with a great deal of pleasure listened to the words of welcome so cordially given by the Mayor, and it is fortunate for me that words are not necessary to express the appreciation we have of the hospitality of Knoxville. The fact that this Society has met here twice in succession, unprecedented in its history, as far as my recollection goes, is sufficient proof of our love for the people of Knoxville. We are glad to be here and to see you and to discuss all matters pertaining to our line of work. We have not a great deal to say about the fruit this year, as shown by Illinois, any more than to say that we are in it just as well as any of the sister states, and have just as good fruit to show the people. Any of you can see that, by opening a barrel of New York apples, or of any other apples that may come along. We are in it as well as any of them, and of course we know just the reason why we lost out this year and we are going to remedy it next year, and if any of you want to know, you will find it out by asking questions.

THE PRESIDENT—The Secretary arranged this program and he, either by mistake or purposely, left his own name off, and we will now have him make his report, although he is not on the program.

THE SECRETARY—It has occurred to me that the Secretary has a very small place on the program, except to repeat what had been done the year before. From time to time, while I have done the Secretary's work, it has seemed to me that there were certain things that we might pick up as we go along in the way of improvement, if I may be pardoned for talking a minute or two on that, and if you will accept that as part of my report, I will be glad to express a few opinions of my own. The horticultural interest, it seems to me, never has been what it should be. In my experience of two or three meetings we never have accomplished a great deal toward the future. We have a handful of people here at the beginning of a session like this at Knoxville that represents perhaps as many residents here as we have speakers, we have brought probably one-half or two-thirds of the audience at this first session. Now, I would like to ask the question whether that is as it should be? Does that signify that the horticultural interests of Knoxville are progressing, that we accomplished anything since our last meeting

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here? We have one or two numbers on the program that we emphasize as being very attractive, where we hope to have a larger audience, but why is not this one, the beginning where we make our introductory remarks, attractive? What is the meaning of it? Is it a lack of interest? It seems to me that it certainly is. The question then arises, what is the reason for this lack of interest? There is an institution called the Farmers' Institute in this State that has done wonderful work. The horticultural interest is a branch, you might say, of the Farmers' Institute. Why is it that the Farmers' Institute can have a machinery such as it has at work and progressing from year to year? It seems to me that there is a lack of something here in the matter of machinery. It seems to me with the three meetings, the Northern, Central and Southern, and the round-up meeting at Champaign, that the horticultural interests ought to be greater than they are. We ought to have more of an interest right in this little town. This is our second meeting here. The Farmers' Institute is a matter that is managed by directors; they have a meeting in every county in the State; we have three, you might say, Horticultural Institutes in the great State of Illinois. Is that what it should be? Why is it? I have an opinion on this subject and I want to give that here; if some one else has an opinion, we would like to hear that. I have thought all the time that we failed to reach the people. We have a lot of specialists that come year after year and occasionally they drop out perhaps if you do not have their names on the program, but do we reach the common people, do we reach the farmers, those who are living in the country and raise fruit just simply for themselves? It seems to me that there is a chance for an education and the most fascinating feature of the whole thing is left out of the work, that to me is the education of the boy and the girl. How many horticultural programs of the Northern, Central and Southern Societies will show a paper or a specialist who is able to appeal to the boys and girls? Our worthy President gave a little address over at Delavan to about fifteen people one afternoon and had the superintendent of the schools bring in his pupils and gave a most interesting and attractive talk to the children on the matter of grafting. It was absolutely the only thing I have ever heard in my experience of this Society that would appeal at all to a child. I went down to one of our district schools, I happened to be director in the district, one Friday afternoon and I talked to the children something after the style I had learned from Mr. Augustine and I had a most interested audience. The children wanted me to come back and tell them something about fruit. I went down again and I told the children to tell me what was the matter with their apples. Each one had a different story to tell; one said the worms ate their ap-

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ples; another said they had borers working around the bottom of the tree, and right there we had a discussion and those children went back to their homes and talked with their parents and one of the directors came to me and said, "What did you say about some kind of spray mixtures to put onto the trees, could you tell me how to mix it?" That simply shows how that thing might be started. Now, if I could just simply express one opinion it would be that we fail to reach the children. In the course of the next two or three years, when some of these older ones have dropped out of the work, what is going to become of the interests of the Horticultural Society of Central Illinois? We have no young boys growing up in this work and we have no children in the audience. That is, it seems to me, something that we might consider. There is no doubt but what there is a future and a great one for this interest, and the question for us to decide is, whether it is not as great, for instance, as the interest in corn. Why should we let the interest in corn growing increase until they have a school at Champaign to educate boys how to judge corn and to go out as specialists; have we any such thing as that in horticulture? Have we any school of horticulture where they can take a short course in the University and take a certificate? They have a school in horse judging; twenty young men went there to study horse judging and five or six had certificates to go out and judge at State fairs and I believe last year was the first time they ever attempted anything like the use of a score card in horticultural exhibits. I think we might benefit from a general expression of opinion along this line.

THE PRESIDENT—Our friend Burrows has given us the blue side and no doubt it is very practical and all right. I wonder if Senator Dunlap will not give us a little of the other side.

MR. DUNLAP—I do not know that I could add anything to what Mr. Burrows has said. I endorse what he said, that we need more interest in the Society. Our Society is not alone in this. The Southern Society met at Salem, in Marion county, right in the very heart of the fruit interests, and some of the men who are most interested in fruit culture, who are in the store business in town, did not take the time to go across the street to attend the meeting there; so it is not to be wondered at that meeting as we do here at our first session that we fail to have the attendance that we hope for. I do not know how you are going to get an audience unless you have some local member who is enthusiastic, who will go around and interest and stir up the people and get them to come to the meeting. If we get the people here, I think we could interest them. Any man who makes his money by growing fruit cannot afford to

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stay away from meetings of this kind. I see men who have eighty or one hundred acres in apple orchards and they absolutely do not know the things that have taken place in the last ten years in horticulture. I never attended one of these meetings, however small it might be, but what I felt repaid for the time and money spent in attending.

THE PRESIDENT—I want to emphasize one thing that our Secretary said, and that is that we are not giving attention enough to the education of the children. I have been going to Farmers' Institutes, talking about fruits, for the last twenty-five years, and about four years ago I said, "Now, I have gone to the last institute to talk to old and retired farmers that moved to town, quit planting and quit everything, and they come in and listen and do not practice, and they are not expected to practice. Now, I will not come out unless you will agree that the schools will be dismissed and give me the children to talk to." I did that, I had an interesting audience, and I believe that that is the secret of the whole thing. We want to interest the boys and girls in this work.

TREE PLANTING.

J. R. REASONER, URBANA.

It is not our purpose, in this brief paper, to cover the whole ground of tree planting, but merely to open the way for questions, and a discussion which may draw out the observations and experience of those present.

My own observations and experience have been, mainly, with shade and ornamental trees. I have had but little to do with the planting of fruit trees. As it is necessary to wait several years before we can receive much benefit from the tree, after it has been planted, it is very important that we shall plant it in the best possible way, so that its certain and speedy growth may be secured.

When the lawn or park has been determined upon, it usually becomes desirable to plant trees of a larger size, so that we may have benefits from them as soon as possible.

I desire here to emphasize the importance of using trees which have been previously transplanted. The young trees in the nursery are lifted, their roots are pruned and shortened, after which the trees may be replanted where they formerly stood. This operation

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prevents the growth of long and large trunk roots and causes a growth of a mass of small rootlets within a short radius from the trunk of the tree, so that when the tree is finally transplanted the roots need not be seriously cut or mutilated. This operation may be repeated until the tree is almost any age or size, and if properly handled and transplanted after such treatment, do not receive any serious check to their growth. Most of the hardwood trees, including the hard maple, have the reputation of being very slow growers, and for that reason have been less frequently planted. If the hard maple and other hardwood trees have been properly transplanted, their subsequent growth is likely to compare favorably with most other trees. The demands are constantly becoming more imperative for long-lived trees. Where the grounds are small, trees which grow to enormous size in a few years should be avoided.

When transplanted, most trees have their chances of growing greatly improved by a liberal top pruning.

The oaks, hickories, hard maple, and especially trees of the magnolia family, including the tulip tree, require heroic pruning or cutting back. Top pruning of evergreens is not recommended.

It is possible to transplant many kinds of trees almost any time in the year, but the best time is when the tree is in a dormant condition. Fall planting is highly recommended by many.

The magnolia, and other trees having fleshy roots, are most successfully planted in the spring, when the buds are beginning to swell, or when they have commenced to open.

One of the essentials in successful tree planting is to have the tree dug without bruising or mutilating the roots. Violent pulling or bending the trunk of the tree whilst digging is liable to cause a fracture or slip in the bark which may cause a wound which is not likely to heal. Many trees are ruined in this way; the tree will probably continue to grow, but when a heavy wind storm comes, the trunk of the tree is liable to break off at that point.

It is better to refuse all trees which come with scars and bruises upon their trunks.

As soon as the tree is dug it should have its roots protected. A few moments of sun and wind are sufficient to kill the small rootlets which are so essential to the growth of the tree.

One of the best means of protection is to puddle the roots, which is done by digging a hole, throwing in a few buckets of water,

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and then stirring in with a hoe loose clay or loam into which the roots are dipped until they are thoroughly coated. When this has been done they should be protected by dampened moss or straw, and as far as possible be kept in a damp, cool and shaded place.

In the growing, handling and successful transplanting of trees there are numerous details. I have barely opened the subject. The discussion which is to follow may more thoroughly cover the ground.

DISCUSSION.

MR. WINN—I do not know that the speaker covered a point, if he did I did not catch it, as to whether, when he is going to transplant a tree, he takes a knife and cuts off the root so as to have a perfectly smooth cut before putting it in the ground.

MR. REASONER—I am glad you mentioned that; you are right in that. Even where they are dug by the tree digger, as often happens, the shear may be blunt and dull and may go along squarely or obliquely, but it catches on a root and if it is blunt and dull, it bruises it and when the shear gets about half or two-thirds through, it will split it, and there will be a long fracture, and of course where it is bruised that way, it is impossible for it to throw off any rootlets, and they will probably decay. By trimming those roots nicely and cleanly, you will find by next year that there are probably fifty to one hundred small rootlets that have come out just under the bark. Then the top of the tree should be pruned correspondingly so as not to make too heavy a draw upon these roots. I am in favor of heroic pruning in a great many cases. Especially with the magnolia family, you must prune severely on them; do not be afraid to cut. Do not be afraid to cut on the oak, if you have a good root system, it will throw out a good head and you will gain time by it.

MR. STANDISH—I would like to ask Mr. Reasoner whether he would plant magnolias in the fall or spring?

MR. REASONER—I have had a great deal of experience with the magnolia; the tulip tree and several varieties of the magnolia, the acuminata, and I prefer to plant them in the spring just after the buds begin to swell, or even to open. If you plant them too early in the spring before the ground gets warm there is danger of losing them, but I transplant my magnolias and transplant them with good results. But I repeat, with the magnolia tree, it is always best to transplant after the buds begin to swell.

THE PRESIDENT—Name a tree for me that it is better to plant in the fall than in the spring in Central Illinois—any one variety?

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MR. REASONER—I confess that I do not know of any one that can be transplanted with any advantage at all in the fall. Another thing, I know of a great many that have their trees lifted in the fall, as soon as they go into a dormant condition. I have transplanted trees every month in the year and I have transplanted walnuts on the Fourth of July. I gave Dr. Burrill a sweet gum, I think it was about the Fourth of July, he said he would like to have that. I said, "I will fix it up for you." He said, "You will have to wait." I said, "I will get it," and it is growing on his lawn today. But that is not the rule. The time to plant is when the tree is in dormant condition, and of course in the fall after the leaves are all off and the terminal bud has formed, then they can be taken up with safety and I find frequently that they are thrown out and the roots are allowed to dry, and then perhaps they are heeled in and then again in the spring they are lifted perhaps about the time the buds begin to swell, and so far as my observation goes, I do not believe that there is anything at all to be gained by lifting them in the fall and heeling them in. I prefer to take them and put them just where they will grow. There are a good many dangrs; they become dried out and a good many other things, and I do not like the idea even after the growth has started; once the tree has been taken up, it should remain in the bed where it has been heeled in until the buds begin to swell and then if you disturb it, you will break the connections and it seems to throw it back and to my mind it does not recover during the whole year.

DR. HUMPHREY—Ought not most of the evergreens be planted late in the spring or early in the summer?

MR. REASONER—Well, fairly late, not too late. Just as soon as the growth has commenced, I plant and transplant the picea pungens, that is the Colorado blue spruce, and some other things, and I think I have never lost a tree, though I prefer to plant them in the spring.

DR. HUMPHREY—What I meant to ask was, if they could not wait later than other forms of trees?

THE PRESIDENT—Surely.

DR. HUMPHREY—Evergreens may be planted later in the spring and earlier in the summer than other trees.

MR. REASONER—Yes, I think so.

MR. STANDISH—I have had considerable experience in planting different kinds of trees, particularly ornamental trees. The magnolia and all trees of that character that have what we call

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fleshy roots can never be planted in the fall. I have had more trouble with magonlia acuminata in planting than with any other tree that I have had anything to do with. I have planted certain grounds and in this city planted last year, or directed the planting of a park, that I laid out here. I planted the almshouse grounds here and I will invite you to come up there any time and see the beautiful trees that are there and as I remember, out of all that planting of large grounds, we did not lose a single tree nor shrub. I planted the Normal grounds at Macomb, sixty acres. When I came to the magnolia acuminata, from my experience in planting that tree, I said instead of getting six or eight of that kind of tree we will order twenty-five. I thought that if I could get six out of twenty-five to grow, I should be very fortunate. Now, the fact is, in my experience and what I have seen, that people generally do not know how to handle trees and how to plant them. We have had a good talk here this morning from Mr. Reasoner, but he has not given us any very practical ideas. He has not told us how we should plant a tree, how large the hole should be made, and how deep it should be planted and all these things which are necessary to understand. I find as a general rule that these men who own farms and wish to have ornamental grounds do not understand how to plant these trees, and I should like to have something more tangible and practical so that we can go away thinking that we have learned something. It is all well to talk about digging a tree and cutting off the roots. Mr. Reasoner spoke about certain trees that had sent out three or five large roots at a great distance in the forest, and he said those large roots were cut off. Now, this question arises if they were, say, ten feet long, how are you going to dig them up and plant such a tree? I have a suggestion as to how to treat such a tree. It must be prepared beforehand if you want to remove it successfully and it will not do to go at this work blindly. I have been quite successful as a tree planter on the whole, but there are certain trees that have troubled me very much, and this whole magnolia family is a delicate family to treat or to touch, and yet the magnolia acuminata is one of the finest trees that can be planted and if I lived on a farm I should certainly plant some of those magnolias around my house.

MR. REASONER—I find more difficulty with the magnolia than any other tree I have ever handled. Now, when we remove a large tree from the forest or some place that never has been transplanted, my method has been to go early in the spring before and dig a trench around the tree, perhaps three or four feet in diameter, depending on the size of the tree and cover it up again. I take a sharp knife and trim the roots off smooth; let it stand another year, and then the next spring go lift up the tree and away

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it goes. There is no trouble when you want to remove a large tree, and then planting trees is a different proposition from setting gate-posts. I like the idea of digging rather a deep hole, according to the size of the tree, and three to six feet in diameter, then throw back some of the loose dirt, then make a good bed for it and put it in and sift the loose earth around it and tramp it down so as to close up all the air spaces and instead of watering, I think it is better that we cultivate and have a dust mulch over the surface to retain the moisture. I think one good way to kill a tree in the hot summer is to begin to pour water over it.

A MEMBER—How much deeper would you plant a tree than it stood before?

MR. REASONER—It would depend on the shape of the tree. A tree two inches in diameter I would set three or four inches deeper.

MR. STANDISH—I was at the Arnold Arboretum two years ago. I met there the manager of the grounds, Mr. Dawson, who has a world-wide reputation. This I think was in the month of July, and he spoke to a nurseryman and said, "I want you to send me fifty magnolia acuminata." Fifty in mid-summer, full of leaves that had been growing for some time, and I said to Mr. Dawson, "What are you going to do with those?" He said, "I shall take the leaves off and plant them and I shall save every one of them." And I want to say if I were called upon to vote for the man who I think knows the most in our country about these things, I should vote for that man Dawson.

MR. LLOYD—Mr. Reasoner said that if he wanted to transplant a large tree from the forest, he went the year before and trimmed off the roots smooth with a knife. I cannot see exactly how he can get down with a jackknife and trim off the large roots of a large tree. I would like to know if that is what he meant?

MR. REASONER—Dig down, of course, and get to the roots and then perhaps saw them off or take a sharp ax and cut them off and then take your knife and trim them. Trench down so we can get at the roots.

THE PRESIDENT—I felt inclined to ask Friend Reasoner if he were going to plant three or four hundred acres whether he would go through that process? As we talked about the time of transplanting trees, I asked Friend Reasoner whether there is a variety of trees that is better to transplant in the fall than in the spring, and he could not name a variety, and I cannot, and I have been in the business for forty years, and I do not know of a

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tree that we can plant in Central Illinois but what it is better to transplant in the spring than in the fall, and yet there are trees that we have to handle in the fall. Take a peach tree that is a year old and they are all transplanted at that time, because a two-year old peach tree in the nursery is not worth saving at all, and if we leave them standing out and undertake to transplant them in the spring they are injured; they are not worth rehandling; I would not give five cents a thousand for them. The same is true of the plum. I would rather take a tree of almost any variety, except a hardy forest tree, but I am talking about fruit trees largely; I would rather take a tree that is taken up in the fall and properly ripened and stored away properly and transplant in the spring than to transplant it if it stands out in the hard winter and is taken up in the spring and planted then, because it is more or less injured by the hard winter and the transplanting will check the growth more or less anyhow and very many times it will die from being transplanted after it has been standing out during the winter when otherwise it would grow right along if not transplanted. Brother Reasoner is talking about certain lines of things in ornamental trees. That is all right, but the average farmer wants to know how to plant an orchard and how to take care of the trees and the most important thing in handling trees is to take them up and not expose them to the wind and heat.

TUESDAY—AFTERNOON SESSION.

THE PRESIDENT—The first person on the program I learn was so unfortunate as to be injured and is unable to be here and our Secretary took the liberty to send some flowers to him this morning to let him know that we were thinking of him, and as we have only two other topics on the program for the afternoon and are quite anxious that the high school pupils shall hear Senator Dunlap, and as we did not quite finish the discussion on tree planting this morning, we will spend a few minutes on that if any one has anything further to say.

DR. HUMPHREY—I would like about a minute to talk about tree planting. I have a peculiar way of planting everything, from a tomato plant to the biggest apple tree or biggest shade tree that you can think of. For planting an apple tree, I get a two or three year old tree, sometimes four years old, and I dig a hole and throw out the surface dirt in one pile, then the layers I throw out

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in another pile, careful to keep them separate and I go down two good spades, sometimes a little more, then I take my spade and I spade it all up in the bottom and then I make a beautiful little mound in the center of the hole, and I do not care whether the roots are long or not, I make the hole the same way. When I get that done, I take my top soil, or I have my man take it and I say, "Shovel just as carefully as you can; do not give me any sticks or stones, or branches of any kind, give me nice loose dirt on my hand," and my hand goes around and I see that the dirt goes in the right place and that the roots are all on that inclined plane and stand a little bit angling. When I get all that loose dirt in, then I begin to work around the top and I work back about a foot and a half to two feet. When I get it all filled up within about three inches of the top, I put on from one quarter to one-half of a pail of water. I do not stamp it in on the roots. I do not maul it in any way, shape or manner; I put that water on and nature takes its course and puts those roots all in their natural bed and puts them to sleep, and they go to work as soon as they go to sleep. Then I fill it clear up even with the top. When I get it even with the top, then I step on it gently all around, then I round it a little, then I tread it just as hard as I can tread it.

A MEMBER—How much deeper do you set the tree than it stood before?

DR. HUMPHREY—From one-half inch to an inch. One thing that I do, I turn my tree so that it leans to the southwest. I would rather leave it a little west of south than to lean north as that will expose it to sunscald.

MR. STANDISH—Why do you allow it to lean at all to the southwest?

DR. HUMPHREY—Because the sun, if it leans at all to the north, will strike more directly on the tree and it will scald the bark.

MR. STANDISH—It is because the prevailing wind is the southwest wind.

MR. WINN—I think the doctor neglected to speak of one very important thing, that is, while he sets his trees leaning toward the two o'clock sun, he ought to have a limb pointing to the two o'clock sun so as to protect the body of the tree from sunscald.

MR. STANDISH—May I ask the last gentleman, Why turn a tree? If you know how that tree grew in the nursery, why turn it around so that a limb will point towards the southwest?

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MR. WINN—To protect the body of the tree from the sun.

MR. STANDISH—And by doing that you may have the soft side of the tree, which was the north side, turned to the sun, and your tree will scald, it will take the bark off. Sometimes when I write to men with regard to trees, I will have them mark how they stood in the nursery before sending them, so that I may know. If a tree is turned about, the north side to the south side, you may depend upon it as a rule, it will take the bark off the tree.

MR. WINN—I set out 2,000 trees and perhaps I ought to explain the matter a little more fully. I will tell you the way I plant out trees. Suppose I had forty acres to set out. I would get a lot of dirt put right in the wagon bed, I would take those trees all out of the box while the roots were moist and I would heel them in right in the wagon and have that team go right along and take each tree out of the dirt in the wagon bed and put it right in and not have it exposed to the heat of the sun over five minutes. There are thousands of trees ruined by taking them out, paying no attention to them and letting the sun shine on them. I set out 5,000 trees one year and in one block that I know of I lost sixty-seven trees out of 2,000; these trees were nine years old; I buy that size now.

MR. FOSTER—I think that Mr. Standish's remarks apply more particularly to shade and ornamental trees that have grown five or six or seven years in the nursery grounds before being transplanted, more than to a fruit tree that is not over two years old. It does not make so much difference the way the two-year old tree is planted in the orchard as it does with one that has been grown a long time, and in the case of the orchard tree, a young tree, planted as Mr. Winn says, a little limb extending out as a protection will be all that is necessary, according to the way the tree stood before, but as Mr. Standish says, if he is planting shade trees and lawn trees, to plant them the same as they have been standing for five or six years makes a considerable difference. One other thing in regard to Dr. Humphrey's way of planting, which is theoretically correct, one thing might be added, the tree must be planted firmly. A tree must be left firm in the ground or else it will not take hold and grow.

THE PRESIDENT—Is it not wise, after you get the roots covered, to plant it almost as you plant a post, pack solid and left solid?

MR. FOSTER—Yes.

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MR. WINN—Leave a little loose dirt right on top as a mulch after it is thoroughly tramped.

THE PRESIDENT—Senator Dunlap has planted more trees in the orchard than any one else; perhaps he can tell us something about it.

MR. DUNLAP—I will admit that I do not take all the care that Dr. Humphrey advises in planting trees commercially. At the same time I have had very good success. I do not trim just the same as he would trim. I used to do it that way, but I do not do it any more. In the first place, in trimming a tree for setting in the orchard, I would, instead of cutting the limbs back, all of them as he said, making a nice cone-shaped head, I would cut out about one-half the limbs if there are very many, although sometimes there are none too many, and I would only shorten in those limbs that extend beyond the normal limits of the head in order to make it shapely. I leave the limbs that I do leave full length with a terminal bud on them. We all know that the terminal bud is stronger than any of the lateral buds and if we cut off the terminal bud, we are cutting off the point of greatest strength and growth in the limb, and by cutting out one-half of the limbs, we restore what is called the balance between the cut root and the top of the tree. I do not speak altogether from theory about this. I have tried them both, a good deal like the man that advised his son to be good, saying he would get a great deal more pleasure out of life if he were good than if he were bad, he said he had tried both. I have tried both ways, cutting limbs back and letting half of them remain full length and I find the trees will show quite a remarkable difference in growth in the second year, the first and second year both. The trees will be larger at six or eight years of age that are trimmed in the manner I suggest than they will be when trimmed in the manner I tried at first. Just why it is I do not know, unless it is that the terminal bud is stronger. In planting out the tree, I do not dig the hole so large. I want the ground fall plowed, and I want it plowed thoroughly and I want it plowed to a good depth so that the ground is all in good condition for tree planting in the spring. By having it ready in the fall the ground is pretty well settled and you get a very nice earth to cover your trees with. I would not dig the hole so very deep, I do not think that that is necessary, in fact I believe it is just as well if the ground is firm beneath the roots. I do not pour any water into the hole either, but I have one man hold the tree—I would rather hold the tree than do the shoveling, so if I am in the orchard, I generally hold the tree, that is easier, and when the man puts the fine dirt in the hole, without raising the tree

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from the ground, I shake the tree, vibrate the roots so that the dirt, as it is being put in, settles around the roots and when he gets those roots covered a couple of inches deep, I step down into that hole and then I tramp that thoroughly while he is filling the hole until the dirt is filled in level with the ground and then after that I throw two or three shovelfuls an inch deep perhaps over the ground that is not tramped at all. I find that this tramped ground when it is covered with untramped ground will not bake as it would if it is tramped right at the top where the sun strikes and I would lean the tree to the southwest quite considerably. I find the prevailing wind will straighten up the tree, even if we lean it several inches out of line and it is quite advisable. You go into orchards that are ten or twelve years old and you will see most of the trees leaning toward the northeast. It is because they were set up straight and they were not kept in an upright position and as they lean over they are exposed to the sun and if you want to get the effects of the rays of the sun, you want to put something at a sharp angle to the sun's rays, then lay it almost at right angles to the sun's rays and see what the difference is. You will see quite a remarkable difference in the heat that is brought out there. If the rays of the sun strike it at a right angle, or nearly so, the bark is dried out in the winter time and you have what is called sunscald or rupture of the bark and the beetles or flathead borers will get in there and do considerable damage.

DR. HUMPHREY—If it is a hot day, or sunshiny or windy day, do you not moisten your roots in any way?

MR. DUNLAP—I usually have a barrel partly full of water in the wagon or the cart or whatever we use for carrying around the trees, and I put as many trees as will conveniently go into that. I dig them out of the heeling-in ground which is usually right in the field; I heel them right in where I am going to plant them so that they are handy and I take as many of them out as can be put in a barrel and put them in there with a foot of water or so in the bottom, so that they are moist, and when the dirt gets onto them, the dirt sticks to the root and makes a close adhesion to the soil. It serves about the same purpose that Dr. Humphrey has mentioned.

MR. FOSTER—I can hardly see the thing as Senator Dunlap says in regard to trimming trees, cutting off these terminal buds. I say, cut them off, and I do not know that I can explain very well or tell why, but I will ask him if he ever did any grafting, and if he did, if he left his terminal buds on his scions in making the graft? I think not. If not, why not? The same theory holds good in planting a tree, it seems to me. I should take off most of

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the terminal buds. Leaving the ones that would naturally grow long and strong, they will do it usually to the detriment of the others, whereas, if they are cut off, then you will get more out of those that are left. I do not know whether they are less strong, but they do not grow as quickly if the terminal buds are left—they do not get the chance that they will if the terminal buds are cut out.

MR. DUNLAP—I will ask Mr. Foster if he ever tried trimming trees both ways, side by side?

MR. FOSTER—I have not tried both.

MR. REASONER—I think the better method is, instead of dipping trees in water, one that I practiced and I think with the best results. That is, where I am digging trees, to dig a hole and throw some loose earth into that and then put in the water and make up a mortar, stirr it up with a hoe, make what the boys call a "loblolly," make that a foot or two deep. Just as soon as the tree is out of the ground, plunge it into that. That coats the roots and then by removing the tree and covering it over with some damp straw, you can keep it if you wish a week or two, and that covers over the wounded parts and gives the tree a good send off and keeps it from drying out.

THE PRESIDENT—I almost always agree with what Senator Dunlap does in the way of handling trees in growing orchards. I do not agree with him on pruning.

MR. BUTT—I approve of Mr. Dunlap's system of trimming trees in setting them out. I do not like to cut off the buds unless they are extremely long.

MR. DUNLAP—I would like to ask Mr. Augustine whether he has tried both ways?

THE PRESIDENT—Yes, I have. May I ask you a question, Senator? I want to mention this, just because I think that it is in point. Do you agree with the theory that about eighty per cent of the life of the tree comes from the atmosphere?

MR. DUNLAP—I do not understand what you mean.

THE PRESIDENT—Well, I mean that the life of the tree comes through the foliage of the tree. I believe that is the theory, that it does not get its life entirely from the soil, but about eighty per cent comes from the atmosphere and I believe there is more in that trimming than we think. If we plant a tree without trimming, in nine cases out of ten, it will stand there and simply throw

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out buds, and there are so many buds to develop that they simply stand there for weeks and hardly form a full leaf and the hot sun dries them up in a measure so that they cannot breathe and in nine cases out of ten that tree will stand in that condition until mid-summer and sometimes, if it has vitality enough, it will then make foliage. My theory is to cut them back severely and just let a small proportion of them grow and by no means let the terminal bud remain, because if you do, that one bud is the only bud that will grow at all, but if you cut back, it will make immediately fresh and strong leaves and the tree will breathe better and by fall you will get a larger growth than you will by letting the whole tree stand. I am convinced, because I have tried that in so many thousand cases that I feel convinced I am right.

MR. DUNLAP—You start out with the assumption that no limbs are to be taken off. I say you want to balance the top of the tree by cutting out a portion of the limbs and then if any of them are extremely long, out of proportion, why, you can cut those back. Now, the test of the pudding is in the eating, as the old saying is, and I have tried that. I had five rows of trees that I planted of one variety and alongside of them I planted a number of rows of the same variety and I adopted on one the one process of leaving the limbs without cutting them back, but cutting out about one-half of them, and on the other I cut them back severely, as is usually recommended, and I found that two or three years afterwards I had a great deal better shaped trees from the former process, trees that were not all filled up through the center, but had side branches. I had better shaped trees and much larger trees than I had on the other, and it seems to me that is sufficient proof. Some of these scientific gentlemen can perhaps tell us, when you force growth in an apple tree in starting off, whether the tree first begins to grow at the root or begins to grow at the bud. I do not pretend to tell you which it is, but it seems to me, from the fact that in the bark is stored up the plant food of the year before, it goes to show that there must be some growth intended to take place at the terminal buds and that being the stronger, they start the growth there and between that terminal bud and the tree, I do not care to have any lateral branches.

The President appointed the following committees:

On Resolutions: H. M. Dunlap and O. L. Campbell.

On awards: Mr. Pickrell and Mr. Foster.

The children from the High School entered the room at this time.

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THE PRESIDENT—We are very glad to have these young men and young ladies present and the subject, when I announce it, that Senator Dunlap is going to talk to you upon may not seem interesting at first, but I want to say that if any one of you ever intend to go over to the Normal School to attend there, that you will find it profitable to have some of these things because they will march you out into the flower garden and give you lessons out there for hours at a time, and these things are being investigated and being made studies for those who are preparing to teach others.

CROSS FERTILIZATION IN APPLE ORCHARDS.

H. M. DUNLAP, SAVOY.

Mr. President, Young Ladies and Gentlemen: I take it that most of these students of the High School are familiar with a certain amount of botany and I do not want to take up too much time in going over some of these things that perhaps you have been over thoroughly. May I ask, how many of you have studied botany more or less, just raise your hand. Well, I see a number of hands. How many of you have ever examined an apple blossom to see how many different parts there were in it?

There is considerable history connected with this apple here from the time that it begins to take its form in the bud until it has arrived at its maturity, and I will briefly recite that history. An apple blossom usually takes about two years to develop and the third year it blooms out into a flower. In the first place, we start with a leaf, and at the base of that leaf where it joins the stem is a little bud. The first year, when autumn comes, the leaf breaks off and the bud remains and next spring this bud starts its growth again and goes through that season and at the same time it enlarges, it prolongs itself into a short stem, which we call a fruit stem. It is going to be a blossom the next year. When it comes to the next year, it has stored up enough plant food in the bud and in the bark surrounding it, enough to start its growth in the spring. Without going into the details of everything in relation to this, I want to call your attention to the different parts of the flower, because that is what I am going to talk to you about this afternoon. I have endeavored here with the assistance of a friend of mine who has put a few of the finishing touches on, to draw a picture of an apple blossom. What we call the flower usually consists of the petal that is on the outside, that gives the white or pink color to

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what we usually call the flower, but that is only the ornament of the flower, and we can have a flower without that cover at all, without that petal to make it look pretty. That only makes it attractive, that is one of the things Nature does sometimes that is superfluous, but very pleasant. Now, the real parts of the flower are the stamens and pistils. The stamens are little filaments that you have seen in there on the top that bear little yellow pollen, you have seen that in flowers, that is the pollen and that little fine pollen you cannot distinguish except with a microscope, you will see it is made up of little individual grains, and these grains are either taken by the bees or insects and fall upon what is called the pistil; that pistil of the flower is the part that is directly attached to the seeds of the flower that come up in the center of the flower, you will see the stamens around it. Now, the pistils in the apple blossom, there are five of them, grow right up through the center and all around them are the little stamens filled with this pollen. After that bloom opens and is out for twenty-four hours, perhaps twelve hours, these little bulbs that hold the pollen burst open and the bees come along and they take this pollen dust around over the different flowers from one tree to another and as they are sucking the honey, this pollen becomes attached to their legs and limbs and body and as they go over the flower, it is smeared on the stigma of the pistil as there is a little gum, and when it stays there for a short space of time, this little pollen grain begins to grow and it grows down through the filament of that pistil and comes in contact with the seed which is at the base of the flower and the flower is fertilized or pollinated, as we call it.

Now, there are some plants that are self-pollinating, some flowers that are perfect. The apple flower is perfect and by perfect we mean that it has both the stamen and pistil within the same flower and there are other flowers where there is only the stamen present in one flower and the pistil is in an entirely separate and distinct flower, and the pollen has to be taken from one and carried to the other before it is fertilized or pollinated. There are still other varieties of trees and plants where these flowers are on separate trees altogether, that is, we have what we call the staminate trees. You boys and girls have noticed that in the maples there is one kind of flower on one tree and there is another kind of flower on the other. You have noticed in the willows that there is a difference in the flowers and you have probably noticed that on the same variety of plant, on one plant the flower is different from what it is on the other, and it gives a plant that is either staminate or pistillate, as the case may be, and it requires some method of pollination. Now, when we come to the matter of pollination of apple blossoms, and that is what I am going to

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talk to you about this afternoon, the apple blossom is what is called a perfect blossom. In strawberry growing, the grower sometimes says, in speaking of a certain variety, that it has a perfect flower, a perfect berry, and by that he means that the flower of the berry has both the staminate and the pistillate parts in one flower. There are other varieties that have only the pistillate parts, so that if we were to plant pistillate varieties in our garden, and planted nothing else, we would find that at the end of the season or the next season, we would not have any fruit. In the corn blossom you will notice there is the silk of the corn ear. Now, the silk growing out there is what we call the pistillate flower and the tassel on the top of the corn stalk is the pollen that fertilizes this pistillate flower. If we were to go through the field and before the pollen comes out, cut off the top of the stalks just below the tassel, you would not have any corn in that field. So you see the necessity of pollination of the flower if you are going to have fruit or corn. That is one of the things that Nature has provided.

Now, when we come to study the matter of fruit, flowers, apples, pears and such as that, we find that most all of them possess the perfect flower; that is, they have the pollen and the stigma or pistillate all present in the same flower and for upwards of fifty years horticulturists have been talking about cross pollinization of the apple bloom and other fruit blooms, but it was not until a few years ago, I think 1892, that any experiments were made looking to the production of fruits along this line, and that was with the pear. In 1892 or 1893 the government at Washington sent a man out into some of the pear orchards of New York to find out whether certain varieties of pears were self pollinating, that is, if they pollinized themselves with their own flowers, or if there was any advantage in having other varieties planted alongside of these varieties, or, in other words, should the varieties be mixed up in order that the pollen from one variety would pollinate the stigma of the other variety. Everything was theory up to that time, but it had been noticed that where large orchards had been planted of the Bartlett pear and some other varieties, that in those large blocks of Bartlett pears they very seldom bore any fruit, but in orchards where the varieties were mixed they had better crops, and they sent out from the Department young men who had been studying along these botanical lines to find out what truth there was in it. Now, before I go into that, I want to digress just a minute and speak about the varieties of pears and the varieties of apples. I suppose you know that in order to get a new variety of pear, or a new

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variety of apple, you must plant the seed from some apple or pear, and if you plant half a dozen seeds from the same apple, you may get just as many varieties of apples as you have seeds; even if you plant all from one apple, you are liable to get a sweet apple or sour apple or red or yellow apple from the seeds from the same apple. Now, the way we get variety has been this, in times past they used to plant apple seeds and seedling orchards. In those days horticulturists did not know anything about grafted fruit, or what we term budded fruit, but everything was a seedling variety, because they planted them from seed and they did not know anything about budding or grafting, but each man had a variety all his own and made a monopoly of it. But here comes along somebody who has found in his orchard a tree that bore some particularly fine fruit, certain good qualities, and he wanted some of that fine variety to propagate and some one discovered back there that you could take a bud off that tree, or a scion, and graft it onto the branch of another tree and that would go on and grow and you would get the same variety as that of the tree that you took the scion from; in other words, we have now what we term nurseries in which this matter of budding and grafting is carried on and if we want Jonathan apples the nurseryman cuts scions off some of these bearing trees and he grafts it on the root and he sets it out and that tree grows and he gets the same variety that he took the bud or scion from. So you see in propagating these different varieties, each tree, each variety has its origin in one tree. So in this matter that we are going to investigate as to whether a variety is self-pollinating or not, that is, whether the blossoms from that variety will pollinate themselves and produce fruit, we have to regard one variety the same as if it were one tree, because they will come from one tree, and the flowers on the different trees of the same variety act toward one another the same as though they came from that original tree, and talking about cross pollinating varieties I am going back to talk to you about the pollinating of one variety of apple or pear by another variety of apple or pear, and when we speak of cross pollinating, we mean from one variety to another, and not from one tree of the same variety.

In the matter of cross pollinating of the pear, Mr. Waite of the Department of Agriculture went down into an orchard and took little bags along with him, paper bags, and when he came to a tree that he wanted to test, he would put some of the flowers inside of a bag and fold the bag around them so that the pollen or bees from somewhere else could not get in and fertilize the flowers that he had enclosed in that paper sack. Of course he would have a cluster of flowers, for every bud that comes out in the spring has from

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five to six or seven flowers in it, so he would have a cluster of flowers in the paper sack that would be pollinated by itself—the flowers would be self-pollinated. Then he left some flowers on the same tree that were exposed to either cross pollinating from other varieties, or from the tree itself. In testing these different things, he found out if the blossoms that were under the sacks bore perfect fruit, why, then, it was evident that that variety was self-pollinating, that the pollen from its own flower would fertilize itself, and if he found that it did not, why, he would say that that was not self-pollinating, that it was self-sterile, that the bloom entered the pollen from some other varieties. He found in the course of those experiments that the Bartlett pear and the Anjou pear and some others were sterile so far as their own pollen is concerned, and so in those large blocks of Bartlett pear orchards that had been planted out it was found that they were barren—it was discovered by his experiments that the reason they were barren was because they needed the pollen from some other variety. In some of those orchards there were a few trees of some other variety and it was discovered in his experiments that where the Bartletts were planted right around these other trees in the block where the bees could carry the pollen from that variety to the surrounding trees it was found in all such cases that the surrounding trees would bear fruit, while back in the block a distance away where it was one solid variety, the trees bore no fruit, so that he demonstrated that it required some other variety planted along with the Bartlett and a number of these others for cross pollinating.

That is as much as I will say about the pear. I have noticed for several years in orchards through the southern part of this State, where apples are planted in large acreage, in those orchards where there is a solid block of one variety, twenty, forty or eighty acres, all of one variety, that in what we call the "off" years, those years where we have the weather conditions against us, they have had very poor fruitage on such solid blocks of one variety. Where Ben Davis, for instance, is planted all in one block.

I have had occasion to visit some fifteen orchards down there quite frequently, and half a dozen of those orchards that are planted to one variety have failed about four years out of five, while those that were planted with a number of mixed varieties have had a crop of more or less four years out of five. This year was one of the most marked that I ever noticed, that I have ever had my attention called to, and I observed fully this matter of cross pollination. There was one orchard in particular that had three varieties in it, there were three blocks of forty acres each in that orchard, 120 acres altogether, that is a pretty good-sized or-

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chard, there were about 7,500 trees in that orchard. In that orchard one forty had four rows of Jonathans through it, and with each row of Jonathans there were eight rows of Ben Davis. Well, this year the trees of the Jonathan variety were full all the way through the orchard, while the trees of the Ben Davis, the row on each side of a Jonathan row was fairly well filled with fruit and the second row of the side that was next to the Jonathan row was pretty well filled with fruit, while the other side had nothing on it practically, and the third and fourth row away from the Jonathan either way had practically no fruit on at all. That would indicate that the proximity of the Ben Davis trees to the Jonathan, the nearer they were the better fertilized they were, and it is natural to suppose that the insects would carry the pollen from the Jonathan to the nearest trees of the Ben Davis more frequently than they would farther away. The President suggests that the wind might have carried the pollen. That is a doubtful proposition whether the wind carries the pollen of the apple. The pollen of the apple is a gummy or sticky grain and it adheres, it is not dry, it is not like the pollen dust of the corn stalk and some other varieties of plants where it is blown by the wind. Those who have gone into this matter more fully say that they doubt very much whether any of the pollen of the apple or pear is carried by the wind. So when we come to the matter of apples, it seems to me that this experience has impressed upon us as it never has been before, the fact that we ought to plant our apple orchards in such a manner as to get the greatest benefit from the cross pollination, and in order to get the greatest benefit, several things must be observed. We must observe first that we plant the varieties in such manner as not to have them in solid blocks and instead of alternating one variety in one row, or another variety in another row, we find that in practice we gather fruit four rows at a time, we have a table that has no solid top, it has a frame around it on which is stretched a canvas and this canvas will sag down a little in the middle and when the pickers come along they empty their baskets onto this table and the sorters sort the different grades of fruit and then they are put in barrels. Now, we put those tables in the center of sixteen trees, two rows on either side, two in front and two in the rear, so when we get those sixteen trees picked, we move our table forward to the center of the next sixteen trees, so we are picking four rows at a time, and as a matter of practical utility in picking our fruit, we should plant our varieties four rows of each variety, then alternate with four rows of another variety, so that you will get the matter of cross pollination along with the practical matter of harvesting your fruit with the greatest economy of labor and convenience.

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There is one other thing. We must plant varieties side by side, that we want to cross pollinate one another, that will bloom at the same period in the spring. In the spring of the year we find that some varieties of apples bloom ten days or two weeks ahead of some other varieties. There is the Rome Beauty and the Ralls Janet that bloom a long time after such varieties as Jonathan, Ben Davis and Maiden Blush, and those other varieties will have dropped their bloom before these later varieties blossom out. This flower when it opens out and this pollen which is to fertilize the bloom may not last more than twenty-four to forty-eight hours for the purposes of pollination, so that we must have them bloom together. This year was one of those extraordinary years where the blossoming of the tree was carried on for a period of ten days to two weeks, and I do not know but what you might say two or three weeks from the time the first bloom appeared until the very last bloom of a given variety, and it was for that reason that the varieties that we call off varieties, not the standard varieties, but those that are planted the least for commercial purposes, the Jonathan and Ben Davis are varieties that we plant very extensively in Southern Illinois for commercial purposes, like the Rome Beauty and the Winesap and the York Imperial and such varieties that we plant less extensively, gave us good crops this year. Varieties that bloom at odd periods different from these others. In my opinion one reason was that the bloom of other varieties such as Ben Davis and Jonathan was scattered over a period so that it brought the bloom of the Jonathan and Ben Davis out at a time when it pollinated these varieties. The Rome Beauty is one of those which we call a good promiser and a poor performer, it is one of those late blooming varieties, and our experience and observation this year would lead us to believe that the reason some of these varieties, like Rome Beauty and Janet, failed in the years when we usually have a good crop of Jonathan and Ben Davis, is because in those years the bloom comes quickly, and it does not last more than four days on these varieties, and they are out of bloom before these other varieties like the Rome Beauty come into bloom, so that at the time the Rome Beauty comes into bloom there is no other variety to cross pollinate it, it has to be self-pollinated, or else it would not be pollinated at all, so that if we are going to get the best results, we may have to plant some other variety alongside the Rome Beauty that blooms at the same period as the Rome Beauty. Now, if there are any questions that any of you wish to ask, I will do the best I can to answer them.

DR. HUMPHREY—Has that non-pollination anything to do with apples that bear every other year, that bear heavily one year and then the alternate year do not bear at all?

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MR. DUNLAP—No, I do not think it has anything to do with that; that is another matter that Nature has to do with. When a tree bears exceedingly full in such seasons as that, all the strength of the tree and all the sap of the tree is thrown into the perfecting of the fruit, bringing it to maturity, and the fruit buds that are developed that year are very few and very weak; there is not the plant food stored up for their growth the next spring that there would be if the crop had been a moderate one, and I will say right here that these orchards that I speak of were alongside other orchards of the same varieties and with several varieties in one orchard that did not have any fruit on at all. You will say why is that so? That is right along the line that I was answering, that these orchards that bore fruit down there this year were invariably those orchards that had been cared for, that had been sprayed and cultivated, and the other orchards were the neglected orchards, and consequently, being neglected the year before, as they were this year, when they came to the untoward weather conditions that we had this last spring, the buds were not strong enough to resist the influences of the weather, and consequently they fell right off, they did not adhere to the tree, they were too weak.

MR. STANDISH—How can you make such a tree bear every other year?

MR. DUNLAP—Well, if the weather conditions in the spring were always equal it would be the easiest thing in the world to do that, because with the weather conditions equal, if you start in to take care of your orchard right, in all probability you would have a moderate crop of apples the first year, because it had not been cared for very much the year before and having a moderate crop of apples that year, you would put your trees in good condition the second year, and being a moderate crop of apples that year, it would not overload your fruit buds for the next year, and so in that way it would get to bear a moderate crop every year. But of course these weather conditions come along and upset our calculations, but in such cases as that, if you think it will pay for the labor, you can go to work when you have a heavy crop of fruit and thin it along the first part of August and you will maintain the equilibrium for the next year.

A MEMBER—I want to know about the large orchards, how you get your bees, whether you keep bees, or how do you get the trees fertilized?

MR. DUNLAP—I have to acknowledge to a weakness right there, that I depend on the neighbors' bees very largely, and the insects.

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The bees are not the only insects that fertilize and carry the bloom. There are what we call sweat bees and there are all sorts of insects that carry pollen as well as the honey bee.

THE PRESIDENT—Senator, I cut this apple and I got seven seeds out of it. Do you mean to say you believe that if we were to take these seven seeds and plant them, that we would have seven varieties of apples that one might be a yellow apple or a red apple or a crab apple, whatever it might be, do you mean to say that?

MR. DUNLAP—That is exactly what I meant to say; that those seeds that are from that same apple will produce just as different fruit as you see on these different plates here. Now, why is that? I cannot tell you just why, we only know that it is so, and I, in speaking of that, only wanted to call your attention to this fact, that there are different varieties of apples obtained in this way. There are over 2,000 described varieties of apples in books. We ordinarily think there are 1,000 or 1,500 different varieties of apples, but we have 2,000 known varieties. In my father's orchard, which was planted for experimental purposes along in the sixties, he had over 150 varieties of apples, and I never knew of but one failure of a fruit crop in that orchard after it began to bear.

MR. STANDISH—Is that a good orchard yet?

MR. DUNLAP—Not much of it, most of it is cut out.

STANDARD SPRAY MIXTURES.

B. S. PICKETT, UNIVERSITY OF ILLINOIS.

The preparation of spray mixtures is by no means a new subject to the members of the Central Illinois Horticultural Society. For a good many years the use of various insecticides and fungicides applied to plants in the form of sprays has been advocated far and wide among horticulturists. The application of chemical mixtures and solutions to destroy insects and fungus diseases is no longer an experiment. Spraying is a part of modern horticultural practice. It extends to every branch of the art, whether it be the care of house plants, flower gardens, shade trees, parks, or commercial apple, peach, pear, plum or cherry orchards.

Yet while the practice of spraying is so common and so fully accepted as an essential element in the successful culture of plants,

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it has by no means been used so often or so effectively as it deserves. How many orchardists in your vicinity are making thorough and effective applications of insecticides and fungicides year after year? Do the people in the towns of Central Illinois fight the pests of their shade trees with sprays? Are you aware that apple scab, black rot of grapes, strawberry rust, anthracnose of raspberries, and the blight of Irish potatoes can be prevented by spraying with a proper fungicide? Are you satisfied that you know all about the standard spray mixtures and the way to apply them?

Insects and fungus diseases are increasing in numbers and variety every year. With every increase in the acreage of any crop the pests which prey upon it will multiply accordingly. An increase in the food supply of any insect generally results in an increase in the number of that insect. How often do we hear it said that we did not use to have so many insects and diseases to destroy our fruits as we have now! How often are we told that the apples never used to have any great numbers of worms in them! San Jose scale and Gipsy Moth were terrors unknown not long since, and the curculio was not a particularly serious menace to the apple crop a few years ago. Gentlemen, the ever increasing host of pests that work by day and night, in season and out of season, to bring about the undoing of the horticulturist, follows as a result of modern conditions in the horticultural world. With the spread of gardening, orcharding, floriculture, and ornamental horticulture, new pastures, rich and inviting, have been spread out to the insects, and they have waxed fat and numerous at our expense. Fungous diseases have taken firm hold on our trees and shrubs and flowers, and it behooves us to take extraordinary measures of precaution against their invasion and drastic and effective measures for their control when they make their appearance. Indeed, insects and plant diseases, like the poor, we have always with us. What then shall we do to save ourselves from the plague of foes that year by year seek to collect not merely toll from the far too patient husbandman, but to demand his whole substance, if he be but weak enough to submit to their piracy?

The horticulturist of the present day, whether his operations are bounded by the lines of a city lot or whether they be measured by the hundreds of acres, is not the man to submit tamely to any kind of tyranny. He has made a fairly successful contest for reasonable railroad rates and shipping facilities. He has solved many problems of cultivation, fertilization, variety testing, and so forth. He grows his roses in the very breath of the winter blast and he preserves the delicate and perishable products of his garden during the fierce heat of July by artificial refrigeration. These

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and many another difficulty he has overcome by a restless and resistless enterprise that brooked no defeat. It came about, therefore, when insect foes and fungous diseases marked the horticulturist as their most tempting victim, that the victim began looking in deadly earnest for means wherewith to defend himself. He found various ways of doing this and among others the application of chemicals that would poison, corrode, suffocate, or repel the insect pests, and prevent the germination of fungus spores, or make the conditions unfavorable for the growth of plant diseases.

The history of the development of effective sprays for the control of insects and plant diseases does not date back so very many years; but from the time of the discovery of the efficiency of arsenical sprays in destroying the Colorado Potato Beetle, and later the accidental discovery of the fungicidal properties of Bordeaux mixture in a vineyard in France, during the 80's, the dvelopment of spraying has proceeded with a rapidity that is remarkable. Several books and innumerable bulletins have been written upon the subject, but so fast has new information been gathered that many of them were out of date almost before they had left the printers' hands. New materials were tried; new machines were manufactured for their application; and commercial men vied with experiment station men in efforts to perfect the sprays and the methods of application. As a result of these combined efforts a considerable amount of data has been obtained, and though our knowledge of the subject of spray mixtures is still far from complete, one may perhaps advisedly take time to stop and sum up a part of the knowledge which is at our disposal.

From among the many chemicals which have been used for making spray mixtures a certain few have come to be recognized as standards. Their efficiency under various circumstances and for various purposes is known, and they can be recommended with the assurance that when judiciously used they will accomplish what is expected of them. It is with these standard sprays that we are to deal in this paper.

Spray mixtures may be divided into three principal classes, and it will aid us in distinguishing the various ones if we keep these classes in mind. First, there are the *insecticides;* second, the *fungicides;* and third, the combined *insecticides and funcicides.* The names explain the characters of the preparations, the insecticides being used for the control or destruction of insect pests, the fungicides for the control of fungous diseases, and the combined insecticides and fungicides for both insect and fungous enemies.

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I do not wish to burden you with classifications, but with these three kinds of spray mixtures in mind, insecticides, fungicides and combinations of the two, we must go a step further, and subdivide at least the first one of these classes into groups and sub-classes.

Insecticides act in different ways. Some of our insecticides are poisons. They must be eaten by the insects in order to be effective. Other insecticides smother the insects by stopping their breathing pores. Such insecticides must touch the bodies of the insects. A third class of insecticides acts corrosively, eating into the bodies of the insects in the same way that an acid or a caustic eats or burns a piece of cloth or the flesh on our hands. Again there are poisonous or suffocating gases which are used to destroy insects, but as our province is to treat of spray mixtures, I merely note this group in passing.

On first thought one might be led to wonder at the very considerable number of sub-classes of insecticides, and the question might be asked why the simple application of poisons alone is not sufficient to control all our troublesome insect pests without having to use anæsthetics and corrosives as well. The reason, however, is not a complicated one. The ways of the insects are very wonderful, and sometimes we think they are almost past finding out. We do know, however, that they vary greatly in their habits of life, in their ways of eating, and in their life histories, as entomologists term the changes through which insects pass from the egg to the adult stages. We know, for example, that many insects which destroy our orchard and garden crops, do so by stripping the plants of their foliage, literally eating the leaves and swallowing them as many of the larger animals do. These we speak of as chewing insects, and it is not difficult to see that the placing of poison on their food will readily result in their destruction. It is not so well known, however, that there are other insects, not less destructive than these chewing insects, which do not masticate their food, but which, by means of lance-like mouth parts and tube-like beaks, cut through the skin of the leaf, fruit, or branch, and suck their food from the juices or sap of the plant beneath the skin in the soft tissues. How can these pests be destroyed? Not by poisons sprayed upon the skin of the plants, for this they merely pierce without eating any part of it. Such insects must be attacked in some other way, and the use of soapy solutions and oils of various kinds that would stop their breathing pores and so suffocate them was the method devised. Elated by the discovery of two effective ways of fighting his insect foes, the horticulturist quickly discovered that the enemy was adopting special precautions

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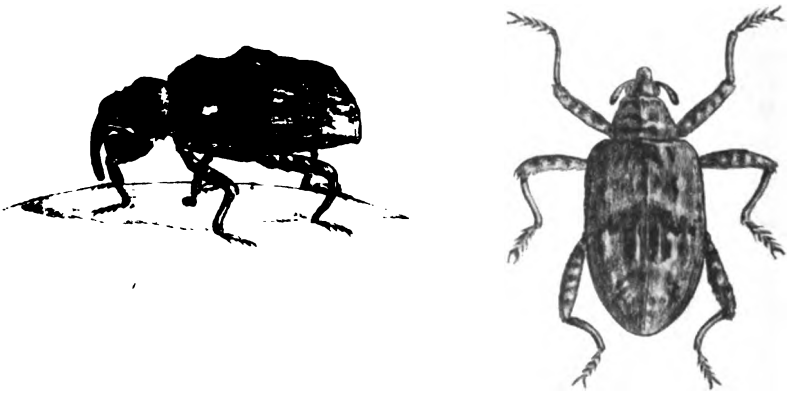

THE PLUM CURCULIO, ENLARGED.

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against being either poisoned or smothered. At least it would appear almost as though the "pesky bugs" had armed themselves to resist the sprays, for lo, a host of insects wearing scale armor and waxy overcoats appeared in the field, ready to do battle with the husbandman for his crops! These insects, among which are the well known Oyster shell Bark-louse, the Scurvy Scale, the Mealy-bug of our house plants, and the dreaded arch-fiend of all our newer insects, the San Jose scale, hid secure beneath their armor of wax or plate from the common soap and oil sprays. They, like their unprotected cousins, the soft-bodied plant lice, sucked their food from the plant tissues, and could not be destroyed by poison sprays. It was, therefore, against these scale insects that the corrosive sprays and some suffocating sprays of an especially penetrating or sealing character were devised and found a place among the standard insecticides of the up-to-date horticulturist.

In this paper, therefore, it is the attempt of the writer to describe the preparation of several standard spray mixtures under their various classes and sub-classes.

CLASS I—INSECTICIDES.

Sub-Class A—Poisons.

The best known and most commonly used of the standard poison sprays are the arsenicals. The basis of all of these is the element arsenic, but there is a considerable difference in the properties of the different arsenical poisons.

Paris Green.

Paris green is the best known and in its pure form one of the most satisfactory of the arsenical poisons. It is, however, commonly adulterated with foreign substances, and sometimes contains a percentage of free arsenious acid dangerous to foliage. The former, of course, lessens the effectiveness of the poison, and the latter, being soluble in water, is very dangerous to plant life and will destroy or injure the foliage of plants to which it is applied. Paris green should be applied with a small quantity of lime in order to neutralize any free acid that may be present, and it is ordinarily used in the following proportions:

4 ounces Paris green.

½ pound fresh lime.

50 gallons water.

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Slake the lime carefully in a small quantity of water by pouring on just sufficient to start the slaking. Add just enough water from time to time to prevent burning. The lime, when properly slaked, will be found in the form of a thick white paste. Dilute this paste with water enough to make a milk of lime that will pour readily. Pour this milk of lime through a strainer that will remove all lumps, into a spray tank or mixing tub containing water to make up fifty gallons of spray mixture. Mix the Paris green with a pint of water taken from the spray tank, by shaking the two together in a jug or large bottle. Pour this mixture through the strainer into the diluted lime water in the spray tank and keep the whole well agitated during the process of spraying.

For the control of the Colorado Potato Beetle on Irish potatoes it is customary to double the quantities of Paris green and lime, using eight ounces of the former and one pound of the latter; and in spraying for Codling Moth of apples it is not uncommon to use six ounces of Paris green instead of four ounces as stated in the formula previously given.

Arsenate of Lead.

Of late years arsenate of lead has become a standard arsenical spray throughout the orchard sections of the United States. This poison possesses several distinct advantages over Paris green. It is more adhesive, does not settle out so rapidly, and can be applied in any reasonable quantity to foliage without danger of injury. Its one chief disadvantage is its relatively higher cost, for while the material may be purchased at considerably lower price per pound than Paris green, much larger quantities have to be used, four pounds per hundred gallons of water being the amount recommended for application. Arsenate of lead is manufactured commercially by several firms in the United States and is sometimes sold under the name of Disparene. This poison may, however, be prepared more cheaply at home. It is made in the following manner: Dissolve separately in one gallon of water one and one-fourth pounds of arsenate of soda, and in three gallons of water three pounds acetate of lead, (sugar of lead). Pour these solutions one after the other into a mixing tank containing ninety-six gallons of water and stir thoroughly. The white precipitate which forms when the two solutions combine in the water is a mixture of arsenate of lead and other chemicals formed in the reaction. When using only arsenate of lead in the spray mixture the solutions of arsenate of soda and acetate of lead may be mixed in the spray tank itself without the use of a special mixing vat. Both the compounds used in the making of arsenate of lead dissolve much more

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readily in hot water than in cold, and unless the solutions are prepared some time before they are to be mixed, time will be saved by using hot water. The price of the materials for the home-made arsenate of lead was eleven cents per pound in 100 pounds lots, during the present season (1907).

It should be stated as a precaution in the manufacture of home-made arsenite of lead that the acetate of lead and the arsenate of soda be pure. Should either of these be adulterated with other substances there is danger of injury to the foliage.

Arsenite of Lime.

The cost of both arsenate of lead and Paris green is a serious objection to the use of either of these poisons, especially when large plantations are to be treated. To meet the demand for a cheaper arsenical spray of equally destructive power home-made compounds of lime and arsenic have been recommended. The commonest one of these compounds is arsenite of lime prepared by making a solution of arsenite of soda and mixing it with a certain quantity of lime water mixture. The formula for its preparation is as follows:

1 pint arsenite of soda { 2 pounds white arsenic
8 pounds sal soda
2 gallons water.

2 pounds fresh lime and 50 gallons water.

Prepare the arsenite of soda by boiling the white arsenic and the sal soda together in the two gallons of water for 15 minutes. Replace the water lost in boiling. Keep this solution, which is a stock solution, in an earthen jug labeled "poison," and put it out of the reach of children and where it will not be mistaken for anything else than a deadly poison.

When ready to spray slake two pounds of fresh lime in the manner described in the directions for preparing Paris green mixture. Mix the paste with enough water to make up fifty gallons of spray mixture, pouring it through a strainer in order to take out all the lumps. Add one pint of arsenite of soda solution from the jug, taking care to shake the jug and to stir the spray mixture thoroughly after the poison is added.

Arsenite of lime must be used with great caution. The directions for its preparation must be followed explicitly. The lime used must be fresh and good. Measurements and weights of materials must be accurate. Unless these precautions are taken, the chemical union between the arsenite of soda and the lime, which

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results in the forming of the arsenite of lime, will be imperfect; soluble arsenic will be found in the spray mixture, and there will be great danger of burning the foliage.

The three standard arsenical poisons of the present time, then, are Paris green, arsenate of lead, and arsenite of lime. Of these the most expensive is arsenate of lead and the cheapest is arsenite of lime. Of the three arsenate of lead is the safest and most adaptable, and arsenite of lime the most dangerous in inexperienced hands. Paris green, therefore, occupies a position intermediate to the two, and for general purposes will continue to be used until it reaches a price where horticulturists are driven to the use of some cheaper poison. Whether that point has been reached yet or not remains to be seen, but indications point to the near approach of the time when less expensive poisons must be used.

Sub-Class B—Suffocating Sprays.

Spray mixtures which suffocate insects by closing their breathing pores form the second sub-class of insecticides. These mixtures are usually oily or soapy compounds and are applied in a mixture with water, known as an emulsion. There are, however, other compounds used for this purpose which do not come under the head of emulsions, one of the best examples of which is a decoction made from tobacco.

Kerosene Emulsion.

Of the emulsion sprays the one most widely used is kerosene. Kerosene emulsion is a very penetrating insecticide, one of the most efficient against sucking insects. It may be used to advantage for destroying plant lice on house plants, in the garden, or in the orchard. The formula for its preparation is simple. Use:

½ pound whale oil soap, or hard soap, or 1 quart of soft soap.

2 gallons kerosene.

1 gallon soft water.

Dissolve the soap in the water heated to boiling, remove the water from the fire, and add the kerosene to the hot mixture, churning or stirring it violently at the same time. This can be done most readily by pumping the mixture back upon itself through a hand force pump of the bucket type. Continue the mixing until a creamy emulsion is obtained which shows no free oil on its surface. The emulsion made in this way will keep indefinitely and may be diluted as required for use. The quantities given in the

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formula above for the preparation of kerosene emulsion are sufficient for thirty gallons of spray mixture; that is, the three gallons of emulsion are to be diluted with twenty-seven gallons of water. This strength is for application to apple and pear trees in foliage as a remedy for Green Apple Aphis, Woolly Aphis on the trunks and branches, Pear tree Psylla, etc. For cherry, plum, and peach trees, and plants with tender foliage, dilute with twelve parts of water or thirty-six gallons. For house plants dilute with fifteen parts of water or forty-five gallons. For scale insects sprayed on the dormant wood in spring or fall, or brushed on the trunks and branches after the foliage appears, dilute with five or six parts of water or fifteen to eighteen gallons of water.

Whale Oil Soap.

Most soap solutions have a considerable insecticidal value against the soft-bodied plant lice. They are, however, very different in their composition and effectiveness. Among the most effective for the destruction of aphids and even for scale insects are the whale oil soaps. These soaps are made of potash lye or caustic soda, fish oil, and soft water. The potash lye soaps are soft and have been found more efficient insecticides than have the caustic soda soaps, which are hard and do not go so readily into solution as do the soft forms. Whale oil soap is ordinarily purchased ready for use and not manufactured at home as is kerosene emulsion. For soft-bodied insects for application while the foliage is on the plants, use one pound of whale oil soap to eight gallons of water. Applied as a remedy for San Jose scale while the trees are dormant, use one pound to one gallon of water. The soap should be dissolved in hot water.

Tobacco Decoction.

Decoctions made from tobacco are useful chiefly as insecticides for house plants, garden truck, or young trees. They are applied for the soft-bodied insects in the same manner as is kerosene emulsion, and they possess an advantage over that insecticide for use on house plants in leaving no disagreeable odor. The decoctions cannot well be made in large enough quantities for application to orchards of large trees, but they are often used as dips for the destruction of aphids infesting the leaves at the tips of the branches of young apple and cherry trees. A bucket of tobacco water is carried from tree to tree and the infested branches soused thoroughly in the solution until the aphids are covered with it. The decoction is made by boiling two pounds of tobacco stems or tobacco

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dust in a gallon or more of water for a period of thirty minutes. Water is added sufficient to make up a quantity of five gallons of the solution. The decoction is then used without further dilution.

Kerosene emulsion, whale oil soap, and tobacco decoctions are tried and tested contact insecticides, and may be rated as standard spray mixtures for certain classes of insects. Kerosene emulsion and whale oil soap are more applicable when large areas are to be treated. Both are cheap enough and readily enough prepared to be used against such insects as the Green Apple Aphis, the Woolly Aphis of the Apple, slugs of various kinds, and the young of various scale insects. Tobacco water is also quite inexpensive, but its use is chiefly to be recommended in greenhouses and for house plants when they become infested with green or black aphids, Mealy-bugs, or Lecanium scales. Often these plants can be more or less completely dipped into the solution, thus thoroughly wetting every part of the plant where an insect might be hidden.

Sub-Class C—Corrosive Sprays.

Our third group of insecticides comprises the corrosive sprays, mixtures which eat through the bodies of the insects and disorganize the animal tissues. Of these there are a considerable number, but the standard ones are the lime and sulphur washes. Lime and sulphur washes are made up in a number of different ways and are known by various names generally taken from the locality where they were first used. Thus, we have the Oregon wash, the California wash, and the ordinary lime-sulphur wash proper. The Oregon and California washes contain other ingredients in addition to the lime and sulphur, but many experiments performed in this State, and in other States as well, indicate that they are not more effective than the simple lime-sulphur washes as insecticides. We shall, therefore, direct our attention to a study of the lime-sulphur wash as the standard corrosive spray mixture for Illinois.

Lime-Sulphur Wash.

The formula for the preparation of lime-sulphur wash is as follows:

15 pounds fresh lime.

15 pounds sulphur.

50 gallons water.

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The method of preparation is somewhat difficult since it requires the boiling of large quantities of water and a more or less elaborate mixing of the materials. Professor Forbes of the University of Illinois prepared lime-sulphur washes for his experiments in two ways, differing somewhat in details, but about equally efficient as insecticides. In mixture No. 1, the sulphur was mixed with enough water to form a thin paste. The paste was added to twelve gallons of water heated nearly to boiling point. The lime was then added unslaked and the mixture boiled and stirred for forty minutes, after which it was strained into a fifty-gallon tank and the tank was filled with water. In mixture No. 2, the lime was first slaked in ten gallons of water, the sulphur was then stirred in dry, and the whole was cooked from thirty to forty minutes. The New York Experiment Station at Geneva used this latter method, but boiled the lime and sulphur in the full quantity of water, fifty gallons, instead of in ten gallons, and continued the cooking from one to two hours.

To prepare lime-sulphur wash for use in orchards, gardens, or parks, it is best to boil the lime-sulphur mixture for one hour. Professor Forbes gives the following directions for the preparation of lime-sulphur mixture:

"For fifty gallons of the spray, heat twelve gallons of water in a forty-gallon iron kettle, mixing, in the meantime, in a separate vessel, fifteen pounds of sulphur with enough water to form a thin paste. Add this sulphur to the water in the kettle and bring the mixture to a temperature just below boiling. Then add fifteen pounds of best lump lime, keeping cold water at hand to use as the mixture threatens to boil over. After the lime is fully slaked, boil for sixty minutes, with almost constant stirring. Then strain into a fifty-gallon spray tank and fill with water which had better be warm, although cold water will do."

The essential differences between Oregon wash, California wash, and simple lime-sulphur wash, consist in the fact that Oregon wash contains a small quantity of copper sulphate, and California wash a considerable proportion of common salt. For purposes of comparison the formulas of Oregon wash and California wash may be stated as follows:

Oregon Wash.

20 pounds lime.
15 pounds sulphur.
2 pounds copper sulphate.
50 gallons water.
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California Wash.

15 pounds lime.
15 pounds sulphur.
15 pounds salt.
50 gallons water.

CLASS II.—FUNGICIDES.

We come now to the second great class of spray mixtures, the fungicides, the preventives of fungous plant diseases. As certain kinds of animals prey upon other animals, so certain kinds of plants prey upon other plants. Some of these parasitic plants are quite similar to ordinary plants. Thus Mistletoe grows upon the oak and is not unlike other green plants in general appearance. The Dodder grows upon the clover and has many things in common with other green plants. But fungi are different from Dodder and Mistletoe. They have no green color, and often they grow almost wholly inside the host. Fungi do not produce flowers in the same way that characterizes most of our plants, but reproduces by means of spores, little pieces of buds, so to speak, of their own living matter, which go on and reproduce the new plants. They are ordinarily delicate plants, sometimes microscopic, and always made up of little threads of cells of very delicate structure.

For economic purposes we think of fungi under two groups, those which grow wholly or largely within the tissues of the host plant, and those which grow on the outside and send feeding threads or hostoria into the tissues of the host. We must fight the first kind by preventing the little spores from germinating on the surface of the plant and so obtaining an entrance to the tissues; and we may fight the second class by spraying some substance upon the fungus itself that will destroy its threads, or mycelium, as botanists call the thread-like body part of the fungus. Preventive measures are, however, better for both classes, and, fortunately, both sorts of fungi can be controlled by some of the same chemicals. Fungicides depend for their effectiveness on the delicacy of the spores and mycelial threads of the fungus. The same substances that destroy the fungi will destroy the plants upon which the fungi grow if applied in strong enough solution. Our orchard and garden plants have a skin or epidermis that is thick enough to resist the action of fungicides when applied in a strength that is sufficient to destroy the thin-walled delicate spores or threads of a fungus. As we can injure foliage by sprays that will not injure the branches, so also we can injure the fungi by sprays that will not injure foliage.

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Bordeaux Mixture.

Among the various fungicides there is none so widely used nor so generally effective in its application as Bordeaux mixture. In fact this is the only fungicide which I wish to discuss this afternoon. The preparation derives its name from the place of its discovery, Bordeaux, in France. It consists of copper sulphate (blue stone or blue vitriol), freshly slaked lime, and water. The mixture itself is composed of complex and insoluble compounds of lime and copper remaining in suspension in water during the process of spraying. It is made up in various strengths according to the purposes for which it is to be used. The following formula is the one most commonly used:

4 pounds copper sulphate,

4 pounds fresh lime,

50 gallons water.

Bordeaux mixture prepared in these proportions (what is commonly known as the 4-4-50 formula) is for general use on apples, pears, asparagus, grapes, tomatoes, melons, and strawberries. It is designed to prevent or destroy apple scab, various cankers and wood rots of orchard trees, brown rot, black rot, and mildews of the grape, tomato and melon rusts, and rust and leaf spot of strawberries.

Made with two pounds of copper sulphate in place of four pounds, it is intended for application to plants having tender foliage, such as peach and plum trees, greenhouse plants, tender seedlings, etc., and made with six pounds of copper sulphate and six pounds of lime, it is sometimes used for spraying potatoes for blight, though the 4-4-50 formula is now more commonly used for this purpose. During the last few years it has become the custom of many orchardists who have sprayed regularly and thoroughly to reduce the amount of copper sulphate used in the standard mixture from four pounds to three pounds per fifty gallons of water, and it will be found that once an orchard is thoroughly cleaned of fungous diseases, the three-pound formula will be quite sufficient to hold them in check afterwards.

I am aware that to many of you the preparation of Bordeaux mixture is an old story, and, therefore, I am somewhat diffident about bringing it again before you at this time. Possibly, however, there may be some here who are not more familiar with it than was a certain old maid with another story. With Mary Per-

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kins the freshness of youth had faded and she remained still unmarried. But there came a time when a lover made his appearance and decided to declare his passion. He was a bashful man and had some difficulty in coming to the point. "Mary," he said, "I'd like to tell you something tonight." "Yes, John," she answered softly. "What is it?" "Well, I hardly know how to say it," John hesitatingly replied. "O, you must tell me now, you have made me so curious," replied the innocent Mary. "But, Mary, perhaps you won't care to hear it; it's an old, old story," came blunderingly from John's lips. "Never mind that," said the practical Mary, "perhaps I've never heard it before."

But whether or not you have heard the story of the preparation of Bordeaux mixture before, there are so many things of importance in regard to it that I venture to tell it again.

To make a good Bordeaux mixture it is essential to use good materials. All weights and measurements must be accurate. The lime mixture and the copper sulphate solution must be diluted when poured together. Only good fresh lime should be used and the same precaution observed in slaking it, as for the slaking of the lime in the preparation of the Paris green mixture. Bordeaux mixture should be handled only in wooden buckets and the pump with which it is applied must have brass parts throughout. It should be prepared fresh for each spraying and it is questionable if it is safe to use mixture which has stood over night in the spray barrel or tank. The mixture undergoes a decomposition when left standing eight or ten hours and the changes result in the production of compounds that injure the foliage.

The following directions for the making of Bordeaux mixture will be found useful:

To prepare fifty gallons of Bordeaux mixture, dissolve the copper sulphate in twenty-five gallons of water. Mix the lime, carefully slaked according to directions given under Paris green, with another twenty-five gallons of water. Then pour the two, simultaneously, through a strainer that will remove all lumps of lime, into a mixing tub or directly into the spray tank if a mixing tub is not available, stirring vigorously as the two solutions fall into the tub.

When large quantities of Bordeaux mixture are to be prepared, it is customary to make up stock solutions of copper sulphate and lime. Fifty pounds of copper sulphate are dissolved in fifty gallons of water, the sulphate being suspended in a coarse sack near the top of the barrel in order to hasten solution. Fifty pounds of

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lime are slaked and diluted with fifty gallons of water. When these two solutions are stirred so that the copper sulphate and the lime are evenly distributed throughout, each gallon of the mixtures will represent one pound of sulphate or one pound of lime. Add four gallons of the concentrated copper sulphate solution, well stirred, to twenty-one gallons of water; and four gallons of the lime mixture, *well stirred,* to twenty-one gallons of water. Mix the dilute solutions as directed in the paragraph above.

CLASS III.—COMBINED INSECTICIDES AND FUNGICIDES.

Of the combined insecticides and fungicides comparatively little need be said. Bordeaux mixture is always the fungicide employed in these combinations and to it are added the various arsenical poisons.

Bordeaux-Paris Green.

Bordeaux-Paris green mixture consists of the standard Bordeaux mixture to which are added from four to six ounces of Paris green for each fifty gallons of liquid. The Paris green is mixed into a thin paste with a pint of water taken from the barrel or tub containing the dilute lime mixture, before the lime and copper sulphate are mixed, a convenient way being to shake the poison and the water together in a jug or large bottle. Pour the Paris green paste into the barrel of dilute lime water and proceed to make the Bordeaux in the usual manner. By preparing the double mixture in this manner a better distribution of the Paris green is obtained and the poison will not settle out of the mixture in the manner common with Paris green.

Bordeaux-Arsenate of Lead.

Arsenate of lead is mixed with Bordeaux in this manner. The solution of arsenate of soda and lead acetate are poured one after the other into the water to be used in diluting the lime paste, stirring vigorously to secure a complete combination of the two solutions. Add the lime paste after mixing the arsenate of soda and the acetate of lead and proceed to mix the Bordeaux in the usual manner. Commercial arsenate of lead, like the home-made arsenate, is mixed in the water used to dilate the milk of lime. When the arsenate of lead is prepared directly in the Bordeaux mixture, an even distribution of the commercial arsenate cannot be obtained, and in the case of the home-made material, a complete chemical union between the arsenate of soda and the acetate of lead cannot be obtained.

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Bordeaux-Arsenite of Lime.

1 pint arsenite of soda

2 pounds fresh lime

50 gallons Bordeaux mixture.

Prepare the arsenite of soda as explained in the directions for making arsenite of lime mixture in the water to be used in diluting the milk of lime for the preparation of the Bordeaux mixture. Then pour the lime and copper sulphate mixtures simultaneously into the mixing tub in the manner described for the preparation of simple Bordeaux mixture.

I have now given the directions for the preparation of the various spray mixtures which are believed to be the best and most serviceable for the control of the principal insect and fungous enemies of Illinois horticulture. Our knowledge of the subject is still, however, far from perfect. Experience has shown that the remedies which are here suggested are effective, widely applicable, and reasonably safe; but experience has also shown that under some circumstances, especially in cases where the preparation or application of the mixtures has not been well understood, or where the chemicals were not pure, no beneficial results followed their use. In fact in many cases injuries have been reported. As time goes on we shall undoubtedly secure better preparations and more convenient forms in which to use them. In the meantime we must go forward under the best light that we have. Spraying has proven itself too essential to the success of horticulturists to be regarded as anything else than a regular operation in all branches of horticulture.

DISCUSSION ON MR. PICKETT'S PAPER.

MR. BURROWS—I would like to ask Mr. Pickett if he knows anything about the use of nitrate of potassium as a spray?

MR. PICKETT—No, I know nothing about that.

MR. BURROWS—I have tried to use a very weak solution of Bordeaux mixture on cabbage worms. It did not seem to affect them at all, and an English gardener told me to use nitrate potassium dissolved in water and cabbage worms simply stopped. The nitrate of potassium's commonly called saltpeter.

MR. PICKETT—Do you use in your Bordeaux mixture any Paris green?

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MR. BURROWS—Paris green? Oh, yes.

MR. PICKETT—The Bordeaux mixture itself is not intended to kill the insect. The Bordeaux mixture is intended to destroy fungous diseases, but that mixture, with a proportion of four ounces of Paris green to fifty gallons of water, should have destroyed the cabbage worms.

MR. LLOYD—Have you ever noticed that different waters dissolve the copper sulphate in different lengths of time?

MR. PICKETT—Yes, I have noticed some differences in that. Weather conditions affect the time required to dissolve the water. I have noticed more particularly on a hot day when the water from the spray pond was quite warm, the copper sulphate would dissolve very much faster than it would on a cold day. It will dissolve slightly faster in soft water than it will in hard water, for the reason that there are already some salts in solution in the hard water.

MR. LLOYD—I ask, because if a man is in a hurry, it will make a big difference whether he can get his mixture dissolved in one hour or in ten or twelve hours.

MR. PICKETT—Copper sulphate may be dissolved very readily in hot water. You can dissolve it in hot water in one-fiftieth of the time that it takes to dissolve it in cold water.

A MEMBER—Have the fruit growers of California abandoned the spraying process almost altogether for fumigation, thinking it more effective? I understand that they have adopted fumigation for their citrus fruits as being superior to any spraying that they could give.

MR. PICKETT—Fumigation was the process which they advised after the San Jose scale first became prevalent, for the reason that they could not find any spray that they thought controlled that insect effectively; but when they found the effectiveness of lime and sulphur washes, they largely gave up the fumigation. The lime and sulphur process is used in nursery practice all over the country.

THE PRESIDENT—I will ask Senator Dunlap to take charge of the Question Box. Do not fail to ask questions and tomorrow we will have them answered, either by Senator Dunlap or by those whom he may select to answer them.

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TUESDAY—EVENING SESSION.

The meeting was largely attended, and Mrs. H. M. Dunlap gave an interesting and instructive talk on "The Profession of Home Making."

On motion of Mr. Reasoner, a vote of thanks was extended to Mrs. Dunlap for her very excellent and instructive address.

WEDNESDAY—MORNING SESSION.

A committee on nominations was appointed, consisting of Messrs. Foster, Dunlap and Pickrell.

The report of the committee on Fruit Exhibit was read and adopted.

(In the list of premiums as furnished the editor the awards are given to entry numbers instead of to exhibitors, hence of no interest to the general reader.—EDITOR.)

Your committee wish to say there has been some mistake in the entry of No. 2, the fruit of which was not in our judgment all grown by the exhibitor and as the rules distinctly state that all specimens must be grown by the exhibitor we have not recognized the entry as eligible for premiums. We would call attention to the display of fruit and vegetables made by Dr. Humphrey of Galesburg and the barrel of Jonathan apples by Mr. C. G. Winn of Griggsville. We think the thanks of the Society are due these gentlemen for their interest and valuable aid to the work.

GEORGE J. FOSTER,
JESSE PICKRELL,
Committee.

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REPORT OF AUDITING COMMITTEE.

KNOXVILLE, ILL., Nov. 19, 1907.

To the Central Illinois Horticultural Society:

Your Auditing Committee have examined the books and vouchers of the Secretary and Treasurer and find the balance, $61.27, correct as reported by the Treasurer, but we find the Secretary's order book contains stubs of orders drawn amounting to $5.25 which do not appear on the Treasurer's books. Either these orders have not been paid or the Treasurer has failed to give himself credit for them. We also find that the Treasurer's book does not show all the money received by the Society, as the membership fees received by the Secretary were deducted from his expense bill and an order drawn for the balance. We suggest for the best interests of all concerned that in the future all money received and paid out by the Society be shown on the Treasurer's book.

Respectfully submitted,

J. R. REASONER,
W. B. LLOYD,
Committee.

The report was adopted.

SUCCESS OR FAILURE IN ORCHARDING.

C. G. WINN, GRIGGSVILLE.

Whether a person succeeds or makes a failure in orcharding depends on a good many things. When some one in a neighborhood makes a rich strike with a lot of apples a great many others are led to plant out an orchard whether they have had any practical experience or not. A traveling fruit tree agent may happen along and sell them a bill of trees from some nursery they never heard of before and when the trees come in bearing they prove worthless.

Some nursery men always have to have something new in order to catch a new set of suckers. The past summer I ran up against one of these slick tongued agents and he had a new dodge in order to sell his trees. He was selling budded apple trees and made the assertion that he could take an orchard of budded trees and grow better fruit without spraying than could be raised on

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grafted trees that were well sprayed. I said, "My dear sir, you do not know what you are talking about. I know you can not do it. I have about 500 grafted trees in one of my orchards and I know there is not a particle of difference between the fruit grown on a budded tree and that grown on a grafted tree."

I suppose if it were not for these agents many orchards would never be planted.

I do not think I ever knew but one instance where a nursery ever sent a grower a better tree than what was ordered. This was when a grower ordered all Ben Davis and the nursery sent him all Jonathan. This grower had the best variety, a fine location but made a failure because he failed to spray and cultivate after the trees came into bearing.

I know of another man who had splendid orchard land, high and dry, three miles from a railroad, who sold this land and bought flat wet black land within one mile of a railroad; set out all Ben Davis. He then built him a $3,000 brick storage house and the only crop of apples he ever made any easy money on was when a buyer bought his apples in a lump. The rest of the time he picked his apples, placed them in this building and put in part of his time in the winter carrying out rotten apples. He would pick up all windfalls and when he packed barrels of apples, some of the windfalls and poor apples went in the middle of each barrel, but in each end he had good apples. He had a brand he put on his apples like this, "Selected Fruit, Grown and Packed by John Doe." It is needless to say he made a failure and recently one forty-acre tract was sold for less than the buildings cost.

I know of another man—a large cattle farmer who had ten acres planted out and took fairly good care of them for five years when one winter he failed to have his trees properly wrapped. And there came a big snow and the mice and rabbits got away with his trees, thus making a failure.

I know of another instance where a man set an orchard of about fifty acres on an ideal location. There were Ben Davis, Willow, Jonathan, Missouri Pippin, Maiden Blush and Grimes Golden. He took very good care of these all for six or seven years and finally became discouraged and cut down ten acres of Grimes Golden, leaving twenty acres of Ben Davis. The ten acres of Grimes I considered more valuable than the twenty acres of Ben Davis. He started out all right, but finally neglected his orchard and made a complete failure.

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Sometimes in a year like the present, no matter how well the trees have been cared for, our crop fails owing I think more to the location than anything else.

This year I was in two localities only where the apples were a fine crop, while in my county they were practically a failure. One locality was six miles east of where I live on the east side of the Illinois river and the other was thirty-seven miles west, on the west side of the Mississippi river. One would think that there would be very little difference in the fruit or the degree of cold in these three localities, but there was a vast difference. With us, we are five miles west of the Illinois river. In other words, between the Illinois and Mississippi rivers, and on upland. Our soil is a clay timber soil. We have nothing to protect our trees. The orchard spoken of east of us is on the east side of the river where the air has considerable frost taken out of it in going over the river. The soil is sandy and the buds were forced out sooner than ours and were in better condition to withstand the severe freezes we had last April. There were numerous ponds scattered around through the bottoms and these helped to take the frost out of the air.

The owner of one orchard I know claims he has not had a failure in fifteen years. Why is this? It is not in the variety, for his varieties are about the same as we have. It is not in his care of his trees, because he does not cultivate or spray any more than some of us other orchardists who have had several complete failures in that time. It is not in cross fertilization, as his trees are not set so the different varieties are all mixed up any more than other orchardists who failed this year; it is not because his location is elevated and has air drainage, for he is on the flat river bottom. No, it is none of these; the only reason I could see is this, he is within five hundred feet of the Illinois river and being on the east side the cold west winds had the frost taken out of them in crossing the river.

As to the other orchard I speak of. It had about 1,800 barrels in it; 858 of them were Jonathans of a very high class. This orchard is situated six miles south of Hannibal, Mo., on a rich black, sandy soil; there are about 250 acres in this bottom which is surrounded on three sides, the north, west and south, by a high bluff. On the east, less than 500 feet from the orchard, is the Mississippi river which at this point is over half a mile wide. To the north of this orchard three miles is a large cement plant where twenty-five carloads of coal per day is burned. These are all the surroundings as far as I could see that would or could have any bearing on the crop of fruit.

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This orchard I packed myself, spending about five weeks, more or less, there, so I had a very good chance to study conditions. Outside of this and another orchard that joined it there was no apples in that locality, either in Missouri or Illinois. In this orchard, the nearer the river, the better the apples, and the higher and farther you got from the river the poorer the apples were. The block of Jonathans covering less than fifteen acres cleared the owner over $3,000.

There must have been some reason why this man had a crop and no one else within fifteen to twenty miles. It was not the varieties, for he had Jonathan, Missouri Pippin, Baldwin, Ben Davis and such sorts; about what other orchardists had who had a failure this year. It was not in the care, for he did not cultivate much. It was not due to excessive spraying, for he only sprayed once. It looks to me as though the river and cement plant warmed up the air enough so the temperature was warmed up sufficiently to prevent the buds being killed.

This fruit was bought, picked down or on the table, at so much a barrel, windfalls, culls and all, a barrel of culls bringing the owner as much money as a barrel of the fancy apples.

I know of a man in Massachusetts who raises Williams' apples who never picks them from the tree; he just puts a lot of coarse hay under the trees and when the apples fall he picks them up and sells them, always at a good price.

The orchardist who can raise apples when most other people fail is the one who succeeds best.

I know of three different persons this year who thought they were badly injured by the spring freeze who kept up spraying the most of the summer with the result they had a fair crop of very nice apples; while some of us who only sprayed twice had almost a complete failure.

I have known persons to raise a very fine crop of apples and then give the most of the profit to some one else by selling them for a mere song to some buyer rather than to barrel them and store them themselves.

Summing up the situation: To succeed I would say first, if possible get a location where you can raise a crop nearly every year, then set out trees that produce high class fruit—like Jonathan, Grimes, Snow and Missouri Pippin. Second, do not undertake more than you can take care of well in both pruning, cultivating and spraying. Third, try to raise the best even if you do not

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have as many as some others. Fourth, Do not have too many of one variety, as it is better to have several varieties so as to prolong the season; then pack and deliver to the consumer an honest package—packed straight from top to bottom.

Do not try to get along with cheap or inexperienced labor, as to pack apples properly expert and reliable labor are a necessity.

Put your name and brand only on the best—something you can guarantee. Do not have a new firm sell your apples every year; select a good firm and stay with it as long as everything is satisfactory. In this way I believe success can be made of orcharding instead of failure as is too often the case.

DISCUSSION.

MR. STANDISH—I would like to ask Mr. Winn at what time in the spring he first sprays.

MR. WINN—Just as soon as the leaves commence to show a little bit, before the buds open out. Just as the buds commence to show a little of the red tinge.

MR. FOSTER—I notice he advises planting the Snow apple, among the high class apples. I do not know how he can call that a high class apple.

MR. WINN—It is one of the best eating apples we have.

MR. DUNLAP—There are quite a number of points in Mr. Winn's paper that I very highly commend. One of them is the location of the orchard along a large body of water. I think there is no doubt but what the river has a very marked influence upon the successful orchard in such seasons as we had last spring and produce an apple crop when none may be produced elsewhere. However, for those of us who are not fortunate enough to have a river alongside our orchard that we can bring into bearing upon this matter, we must devise other methods for producing an apple crop, and one is good cultivation and spraying the year before. In other words, if we sprayed well this year and cultivated so that the foliage stayed on the trees and laid up a good supply of plant food for the fruit buds next spring, we will have contributed a great deal toward the success of the fruit crop. I am satisfied from observation in the Southern part of the State this year, where one could see not only two or three orchards, but hundreds of orchards that had been neglected last year and were neglected this year just the same, failed to produce any sort of crop at all, while other orchards that were cared for last year, if they had

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along with it the proper cross fertilization, they produced pretty fairly good crops, and in some instances exceptionally good crops. I have in mind one orchard where there were several hundred trees of Winesaps and those Winesaps were as full as they ought to be, and Rome Beauties the same way, they were loaded, and so were the Jonathans and in some instances where the advantages were exceptionally good for cross pollination, the Ben Davis had a full crop. Ordinarily the blooming time of trees varies and that has a great deal to do with success or failure. Sometimes if one variety is advanced more than another, we may have a cold night and a frost that will catch those blossoms in such a stage of development that it destroys the whole outfit. That may have been the case in this Missouri orchard that Mr. Winn speaks of, they may have been a little advanced or a little behind, the same as he speaks of in the Illinois river orchard, of what they were in surrounding orchards. That will have quite a marked influence. I know that thirty-six hours has an influence. We have orchards down at Fairfield, just about twenty-five to thirty miles south of orchards in Clay county, and as you know the season advances about fifteen to twenty miles every day in the spring, that what it is today in this locality, it will be tomorrow fifteen or twenty miles north, and so the season progresses from the south to the north in the spring, and the development of our foliage and fruit buds and everything else that follows change of weather. At Fairfield, with the orchards cared for under the same conditions, in every way and treated the same way, we had a practical failure of the apple crop, a total failure in the two orchards that we had and only a very light crop in another one, and twenty-five to thirty miles north of that we had some orchards which were fairly filled with fruit, so much so that it was the difference between success and failure this year as far as expenses were concerned. I attribute that to the fact that those buds were further developed down there, as we all know we had several killing frosts. The first bloom that came was killed; then the next that came out was killed and the third bloom. We had waves of cold that came along two or three days following each other, and then we had warm weather in between in which more bloom came out. The last bloom that came out was the bloom that perfected the crop, if there was one.

There is another thing I want to say. Mr. Winn spoke about spraying, and I want to emphasize that by saying that where we had sprayed five times, we had apples that were much freer from the effects of the second brood of codling moth than we did where we sprayed three times, and I believe it pays to spray five times, especially in wet seasons, and we should do it every season, so far

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as the codling moth is concerned, and if we come to bitter rot, which we had in the southern part of the State, we have to look out for that. The same spraying which will destroy the second brood of codling moth will prevent the bitter rot, so that we combine the two sprayings and we make two hits off the same bat.

MR. STANDISH—Will you state the periods of spraying, how far apart?

MR. DUNLAP—Well, the first spraying is as Mr. Winn says, before the bloom opens, just as close to the time of the opening of the petals as you can get, that depends on the area of the orchard you have to spray. If it is only a small orchard, you can spray the day before or two days before, but if it is a large tract and it takes a week to go over, you have to start in ten days before the blooming, and if you get through, go over that first part again and get it as close to the bloom as you can, and the next one is immediately after the petals drop, within the next five or six days, and then the third spraying about three weeks after that, two or three weeks. That third spraying is more of a protection for the leaves that come out than it is for the protection of the fruit, in my opinion, because there is a large development of foliage, perhaps four-fifths of the growth will be in those three weeks, from the time you spray a second time until you spray the third time, and it is for that reason that you ought to spray again then, and then I would leave off spraying until the very last days of June or first of July and start in again. I would spray at that time and then I would spray ten days later and those two sprays ought to be very thorough. I would spray again, if necessary, if there was a heavy rain; I would spray the third time and make the sixth spraying, and it will pay, I know it will pay, there is no question about it, if a man has a commercial apple orchard, but so far as the average orchard is concerned, the first three sprayings are all that are necessary.

I will say while I am on my feet, that there is a great deal in this suggestion of putting straw or old hay under the tree, especially with summer apples. When the price of summer apples is fairly good, you can put a thin coating of straw, the bottom of an old straw stack or hay stack, spread it out under the trees, as far out as the limbs extend, and you can save a lot of apples that will be as good for the market, especially if it is a good local market, as any others. Then you can sleep better nights, because you know if they drop off you can make use of them to some advantage, whereas otherwise you might pick them earlier than they ought to be picked. Apples must be matured in order to get the best price for them.

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MR. WINN—There is one point that I referred to, but I did not say enough about it, and that is this matter of cultivation. A few days before I left home, I was talking with one of our orchardists; he and his brother own an eighty-acre orchard about seventy miles west of me. One year they had a fine crop of apples. I think they got about $15,000 out of eighty acres and they never had a good crop of apples after that. One year they started out to double up the amount of blue vitriol and Paris green that is recommended by this Society and they burned their foliage. I think I referred to it at one time in this meeting and in talking with one of these men about cultivation, he said: "I will tell you, I believe that a person can cultivate at the wrong time; I know that in our Salem orchard we started to plow one year as soon as we got the apples out of the way and I am satisfied that we injured that orchard very much. I do not believe it ever got over it." Now, in regard to cultivating when it is a benefit, I know of another orchard, a twenty-acre orchard, that was plowed very late in the fall and sowed to rye the next spring, on that part of the orchard that was broken up late in the fall, the bloom came out practically three or four days sooner than the rest of the orchard and in that part of the orchard they had quite a nice crop of apples, while in the other end of the orchard that was not cultivated, it was an entire failure. A year ago in one of our orchards I cultivated early in the spring in order to sow the clover, just ran a disk there very early, just as soon as the frost got out of the ground and sowed the clover on. Now, it sounds a little fishy for a person to tell, but where I cultivated. I barreled up eighty per cent of Ben Davis that I called No. 1 and they were good enough to use on the Chicago market for fancy.

As soon as the frost is out of the ground, as quickly as we can go on the ground and stir up the ground and turn the insects under and liven up the ground, that is the proper thing to do.

MR. DUNLAP—I think as soon as the ground is in proper condition in the spring it is all right to go ahead and cultivate. The way I do is this: If I get an opportunity to cultivate, if the ground is dry enough and I can run my disk harrow in the orchard before I commence spraying, I do that and I use the same team for cultivating that I do for spraying, so when I commence spraying I have to stop cultivating and at the time the bloom is on, I cultivate again between the first and second spraying, then as soon as the second spraying is over, I cultivate for two weeks, or such a matter, between that time and the third spraying, then after the third spraying I cultivate after that until the first or middle of July, never later than the middle of July. I want to criticise Mr.

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Winn's recommendation of varieties. He recommends the Missouri Pippin. Of course I admit that there are certain soils and conditions that the Missouri Pippin does well on, but I wouldn't give a man a yard to plant Missouri Pippin if he would go in and do it for nothing. I would not think he was doing me a favor; that is my opinion of the Missouri Pippin after having tried it in Southern and Central Illinois. They do not grow any larger than the Winesap with me and of course the lack of size is the principal objection I have to it. I do not object to anything else, although I think it has a very poor foliage.

MR. WINN—Let me tell you why I recommended the Missouri Pippin. You know about what apples were worth the first of March, 1906; you know that big fancy prices were not then paid. I sold the Missouri Pippin right out of my own orchard on the Chicago market for $4.50 then, and the buyers wanted more.

MR. DUNLAP—I could sell Ben Davis last year at the same price.

MR. WINN—Yes, but later on, the advance had not taken place yet, and the way I grow the Missouri Pippin, I thin them.

MR. DUNLAP—They were thin enough this year.

MR. WINN—I admit that, but if you had a good crop they will sell for "stand" apples when the Jonathan is out of the way.

MR. STANDISH—I want to ask if you spray during the full bloom?

MR. WINN—No, I never do. Col. Dalton, the orchardist I referred to in Missouri, tried one tree this year to test it; it was in full bloom and he gave it an extra big dose and he thought it was an advantage, but I would be afraid to risk it myself.

DR. BURRILL—May I say one word about spraying? We have gone too far to take anything back in regard to the necessity for spraying apple orchards, to come back to various difficulties that we have had of late years. We cannot grow fruit without very diligent attention to the matter of spraying, but there are two or three things connected with that I think we would be a little better off with a little more understanding. I must say it may be asserted very fairly that spraying is a necessary evil, not only on account of the expense and trouble, but the trees, if they could be let alone, if they were not to be preyed upon by insects and various fungi, they would do better without it. There is, to be

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sure, a little stimulating effect in vegetation from dilute poisons, that is a curious proposition, but it is a fact, very dilute poisons stimulate rather than injure vegetable growths. Copper sulphate has this tendency. I have seen pear and apple trees grown in pots treated with a very dilute solution of copper sulphate that very evidently did better for the treatment. I mean now, that copper sulphate that was applied to the soil. It had to be explained in that way, that stimulating effect of the poison; a greater quantity will be very detrimental. What prompts me to say what I do now are some observations made during this last summer at Centralia. I saw a tree that had not been sprayed and right alongside of it in the same orchard under the same conditions, everything equal, those that had been sprayed in the regulation way with the regulation mixtures well made, no criticism upon that score and the unsprayed trees were distinctly the better. This is not a single observation; it has been frequently made. It has been made use of by the lazy people, by the negligent as an argument against spraying. But that was not the object. I repeat, the spraying is a necessary evil that is likely to be in itself injurious and it has only to be practiced because we can thus free ourselves from greater injuries. Now, in the case that I have mentioned and probably in a good many other such situations similar observations have been made, the fact is that the apple scab fungus that was the main one that was doing the business, was not making any trouble. Well, if we have that condition and nothing else of an injurious character, we would be far better off not to spray. There are conditions we all understand under which an application of copper sulphate is almost surely injurious to the foliage, it is very likely to occur when the proper mixture, just as well made as anybody knows how to make it, is applied during rainy weather when there is much moisture in the air: the combinations that take place chemically in the poison that is in the liquid becomes more pronounced. The injury is likely to be much less when there is continued fair weather. I will say then that while we must spray, we would be glad to avoid if it was not for the parasitic elements in plants against which the spraying is done, and that an explanation may be easily reached why sometimes a part of an orchard unsprayed turns out better than one that is sprayed.

There is one thing further—there is quite a popular impression among the practical sprayers that if they increase the proportion of lime they will thereby be likely to lessen the injury to the foliage. The common formula is four pounds of copper sulphate, four pounds of lime to fifty gallons of water, the 4-4-50 formula, as it is commonly called, that is, equal quantities of cop-

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per sulphate and lime, if the copper sulphate is reduced to two pounds, the four pounds of lime may still be put in with the idea that we would have less burning of the leaves or russeting of the fruit. Or if the full amount of copper sulphate is left, an increase of the amount of lime is made with the same idea. Now, this rests upon a fallacy in regard to the effect of the lime. It is a chemical union between the two substances that gives the protecting power to the lime and we understand well enough that chemical combination goes in regular absolute proportions, that extra amount of lime will not make any less injury at any time. I am not sure that the equal quantity is just the thing that would be most desirable, but when we go beyond the amount of combining over between the two ingredients, go beyond that, then the extra amount fails to serve its purpose entirely.

MR. DUNLAP—May I ask the Doctor a question? In speaking of the use of lime, or the use of an extra amount of lime, is it not possible that some of the acid ingredients of the copper sulphate and the Paris green may by action of the atmosphere, either through the electricty that is in the atmosphere, or by water, or presence of exposure to the air, create a free acid there that an extra amount of lime might tend to prevent injury if it were present, even if it were true that originally they were combined?

DR. BURRILL—My understanding is negative; it does not thus combine. The difficulties that arise are from recombinations of the compounds that take place. Not that there is anything there that would be injurious when we put it on, but the recombinations that take place in exposure to the air in its different stages.

DR. GRAHAM—Is it not true that white arsenic, which is the basis of Paris green, united with water, would make the acid and might not that acid be injurious?

DR. BURRILL—You mean that it comes with the long exposure on the leaves.

DR. GRAHAM—Yes.

DR. BURRILL—Undoubtedly; well, I think it is pretty well known exactly, and I can call upon the chemist on the other side of the room to explain just the recombinations that take place. It is pretty well known just what those are, but that the extra amount of dry lime that might be there would have no corrective effect is pretty well known not to be true.

MR. DUNLAP—I would rather take my chances on a little extra amount of lime, or a considerable excess of lime, than I would

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take my chances on getting it so close to the margin that I was taking chances on not having quite enough, and I think it would be hardly the proper thing to let the impresison, whether Dr. Burrill intended that or not, go out in regard to not using extra lime. I would rather use two pounds extra of lime to spraying material than to use just the exact amount.

DR. BURRILL—May I ask whether this come from experience in using or from theoretical consideration?

MR. DUNLAP—I will say that there is not any theory about it. I have noticed this, that whenever I tell my men to put in just the requisite amount of lime, that very often spray injuries will occur on the foliage, and as a matter of practical application of the spray, you had better tell your men to put in too much than to tell them to put in the exact amount, because if you put in an excess you are sure to have enough, and if there is no injury coming from an extra amount, we would better have a little extra amount, because lime is very cheap.

DR. GRAHAM—In our own experience in spraying, I have found that it was wise to have a test made as to when the proper amount of lime is reached. Of course you readily understand that lime will vary very decidedly in strength, and laying down a certain amount of lime to do a certain amount of work is not necessarily conclusive; the lime loses its strength on exposure. I have adopted this pan in the orchard, always to test the copper sulphate and lime solution after it is made up with a solution of ferrocyanide, I believe the University has mentioned that. That shows us conclusively whether the lime is in excess. That ought not to be neglected, it strikes me, when you are going to spray an orchard of any size. You can tell exactly when you have reached the point where the lime has killed the acid effect of the copper sulphate, and you can tell by the color when the lime has actually killed the acid effect when you put in this ferrocyanide, and the test is so absolute that it is strange to me that orchardists do not use it to any greater extent. It is something that tells you absolutely when you have reached the limit.

The nominating committee reported the following officers for the ensuing year: Henry Augustine, President; J. M. Jordan, Savoy, Vice-President; Jesse Pickrell, Knoxville, Second Vice-President; J. B. Burrows, Decatur, Secretary; C. G. Winn, Griggsville, Treasurer.

On motion of Mr. Dunlap, the vote of the Association was made unanimous for the nominees.

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The report of the committee on resolutions was read as follows:

Resolved, that the thanks of this Association are due to the President and Secretary for the splendid program furnished for the entertainment and benefit of those present at these sessions.

Resolved, that our thanks are due to Mr. C. G. Winn of Griggsville for the barrel of beautiful and "eatable" Jonathan apples which by his generosity we have so greatly enjoyed.

Resolved, that we greatly appreciate the addresses of those who have addressed the meetings of this Association. The many suggestions made and valuable experiences given by the able speakers will add largely to the value of Horticulture in Central Illinois.

Resolved, that the thanks of the Society are due and are herewith tendered to the people of Knoxville and especially to those who are responsible for the free use of the hall and service which have tended to make our meeting a success.

O. L. CAMPBELL,
H. M. DUNLAP,
Committee on Resolutions.

On motion, the report was adopted.

THE SCHOOL GARDEN.

BRUNO NEHRLING, NORMAL.

The object of this paper is to present the school garden problem in the most practical way. School gardens, in the narrow sense of the term, are, in this country, a very modern institution. History teaches us that Cyrus the Elder, 559-529 B. C., laid out the first school gardens in Persia, in which the sons of noblemen were instructed in horticulture. King Solomon likewise possessed extensive gardens probably for the purpose of instruction. Then again we do not hear anything more of school gardens until 1525 A. D. Gaspar de Gabriel, a wealthy Italian, was the first to establish a garden of this kind in Tuscany. Venice, Milan, Naples, Bologna and Florence followed in the order named. At that time every important city in Italy had its gardens. Germany established its first school garden in Halle, in 1695. In France J. J.

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Rousseau advanced the school garden idea, and pointed out the importance of garden work as an educational factor; that was in 1762.

School gardens entered upon a new stage of development when their establishment, in connection with rural elementary schools especially, was required by law. This first occurred in Austria. The Austrian imperial school law of 1869 prescribed that, "where practicable, a garden and a place for agricultural experiments shall be established at every rural school." At the exposition held in 1873 in Vienna it exhibited a schoolhouse with a perfectly equipped garden. This not only gave expression to the new idea, but stimulated further progress. There are at present in Austria-Hungary, the classical country of school gardens, 18,000.

The school garden question has also been alive in Switzerland these thirty years. The government has given them a powerful support. France, Belgium, and Sweden and Germany also have done much toward the development of school gardens.

The above is history, and gives us an idea of what has been done in the old country, and of what importance school gardens really are in the densely populated Europe.

In this country, however, we have as yet no definite organized system of school gardening. Everything is done in an experimental way. The government has published a bulletin on the subject, but it, too, lacks practical suggestions. However, it is all helpful in furthering his kind of work. In the Eastern States and as far west as the Mississippi river school gardens have been started in our public schools. Our city schools are more active, however, than our rural schools. That may be explained in this way: To city children the growth of the plant is like the discovery of a new world. The whole thing is new to them, hence their activity. On the other hand, the children in our rural districts are familiar with the fundamental operations of the garden—preparation of the soil, planting seed and the harvesting of the ordinary farm crops.

The object of school gardens which are being organized at present are of importance on the following grounds: (1) Hygienic, as being a place for physical labor in the open air, so necessary for the teacher and pupil who have been kept confined in the bad and heated air of public schools; (2) scientific educational, as acquainting children with the life of useful plants, developing their minds by the study of nature, and promoting a more moral and aesthetic sentiment concerning trees; (3) general economical,

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as spreading among the people new knowledge relating to gardening, and thereby leading to the production of such food articles as the people of some localities do not now possess.

A school garden to answer the purpose for which it is intended should include: (1) An orchard, from which may be procured grafts and cuttings. (2) Berry bushes and stone fruits, planting only the best table and commercial varieties. (3) Nursery of fruit, berry, forest trees, and an ornamental plot for growing young plants. (4) A kitchen-garden.

For gardens to fulfill their purpose, they must be located either at, or near, the schoolhouse. In the construction of new buildings this fact must be taken into consideration. With old buildings it is not always practicable to combine the two, however, a garden attached directly to the schoolhouse is of much greater value for educational purposes than one at a distance, and as it should exercise a broader influence and serve for the instruction of others, it should be so situated that at least one part faces the street, so that a survey of the whole can be made from the side.

After the garden has been properly located, the next step would be the surface arrangement. When the ground has been portioned off in its various sections the teacher should make a design, laying off the walks and distributing the squares. The main walks and those of the vegetable section must, one and all, be laid off in straight lines, for the sake of symmetry and order. Large city gardens may be arranged like parks, especially those sections containing the trees, shrubbery and the playgrounds.

The management of a school garden requires not only a proper understanding and full command of the subjects to be taught, but a broad view of the work to be done. This can only be gained by an exhaustive plan of work which the teacher must arrange and follow. The plan must cover the work for the whole year, from spring to autumn, and define what is to be done each week. Each year the work must be planned anew, changed or supplemented. Two to three hours a week ought to be reserved for gardening for each grade. In city schools the intermediate and upper grades only need take part. Applicants for work in the garden are, of course, accepted any time out of school hours.

The children are instructed how to manage the implements and how the work is to be done. Flower and vegetable seeds are sown and a few early beds are planted. The sprouting seed is weeded and frequently watered. In the course of the summer vegetable beds are frequently weeded and hoed. The walks are

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also cleaned and kept in good condition. The beds are then distributed among those children who are willing to undertake their care and management. Each child works its own bed independently. It is also entitled to the crops, provided it cares for the plants during the summer vacation. The best pupils' beds are commended in the fall, and those in charge may be awarded with premiums. Although the beds are planted according to pleasure, a certain uniformity should be aimed at for the sake of appearance.

The laying out of a garden always has a distinct purpose in view. As a rule, this is its economic value. The end and aim of school gardens, however, are different. They are by no means primarily designed as a source of revenue for community or for utility in the general sense of the term, but for purposes of instruction and education. In many cases they furnish numerous specimens for object lessons, or are themselves excellent means for observation, in others they give many points for comparison that have the value of direct observation. Instruction in gardens appear partly as occasional lectures, partly as practical work, partly as defined lessons, and partly as constant nature study.

The practical work in gardens affords many opportunities for information of various kinds. In digging the beds the necessity of working the ground is shown, the different kinds of soil may be discussed, and the use of implements demonstrated. The habits, characteristics and qualities of insects and small animals which the children find are discussed, and they are made acquainted with the useful and injurious animals, are exhorted to protect those which are of use and destroy those which are harmful.

In sowing, planting, hoeing, weeding, and watering, the teacher can give appropriate hints and show the practical manipulation of the implements. Many natural phenomena give him the opportunity of explaining natural laws and applying what has been learned. In gathering the crops attention is called toward the commercial uses of the different kinds of produce, and the value of each as an article of food is considered.

There is one thing I would like to emphasize particularly in this connection. All the facts mentioned above are to be arranged in the regular program and to be made progressive in every respect. Children, you know, get tired doing the same thing year after year, whereas, you devise different and gradually advance the work it becomes more satisfactory.

The work of the various classes should be prepared in the room, that is, it should be written on the board and thoroughly explained before going to the garden.

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Besides demonstrating practical things in the garden, one may conduct lessons in mathematics. Thus a class of pupils, under the teacher's direction can measure off the garden and beds and calculate areas. The value per acre, of crops may be estimated, etc. Countless specimens for other studies are furnished by the school garden; as, for instance, drawing leaves for the study of their outline, and painting of flowers. Abundant material for composition is likewise furnished: "My Flower Bed," "Why Are Fruit Trees Planted," etc.

In any educational work the first question which presents itself is, What is the effect of the exercise or the study upon the pupil? It is claimed that garden work, properly directed, and managed with pleasure and understanding, promotes industry, attention, judgment, skill and self-reliance; it develops the sense of order, cleanliness, punctuality, beauty, responsibility and duty, and, consequently, forms the foundation for a firm will and self-reliant action, or, in other words, for a moral character. The free intercourse of the gardens gives the teacher opportunities of knowing their pupils better in a short time. They are consequently able to direct the education of individuals in the best way and by the most appropriate means. The work in common also arouses public spirit in children, the sense of fellowship, and mutual dependence. It awakens an esteem for all manual labor and a proper judgment and valuation of the work of others.

The educational influence of labor is great and lasting. At sight of this or that plant the mature man will, in his own field and garden, recall the time when he first learned something of it in the school garden. Many things obscure then are clear to him now; however, he does not underrate the early impulse, and certainly will not fall behind the boy in zeal, judgment, accuracy and activity.

The establishment of a school garden is easy in most places, since nearly all school buildings have some ground that may be reserved for that purpose. Every new school building, however, should be planned with a view to connecting a garden with it. This should be legally provided for. Not only the State and community, but agricultural and horticultural societies are to be interested in the establishment of school gardens, and should give their support in advancing the idea. Special gardens should also multiply in future.

At present all the normal schools in this State possess gardens in which the future teachers are trained and taught in agriculture and horticulture.

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The idea of school gardens is so simple, natural that the coming century will wonder how public educational institutions could ever have existed without them and been true to their purpose.

DISCUSSION OF MR. NEHRLING'S PAPER.

MR. CAMPBELL—Since the last meeting of this Association here, Knoxville has felt the influence of that meeting and the Daughters of the Revolution have enlisted the labors of almost the entire town and we are now preparing to give a sort of Flower and Field Fair that will be near the railroad so that all who pass by will see that we have a taste for those things. It will take some time to prepare such a field, but I hope you will be delighted by it every time you pass through Knoxville.

MRS. DUNLAP—What is the use of having all this vacant field all around? It gives a stimulus to the work and to the better form of education. I think this is the most essential thing that we need to cultivate.

MR. STANDISH—I wish to ask the question, what are we going to do? I believe in school gardens, I have had something to do with them at Galesburg, but what are we going to do when we have not teachers that know how to plant a crocus or a tulip or a hyacinth and what are you going to do when in the city of Galesburg we probably cannot find twenty persons that can take a rake and level properly a piece of ground? I tell you of the teachers not one in one hundred knows how to plant these things. I speak now from observation. I have been with teachers all my life and I am sorry that we have so many that are not practical and do not know more about these things. If I call the teachers of Galesburg or Knoxville into the park which is called Standish Park at Galesburg, and ask them to tell me what this shrub or this tree is, I can say that I doubt whether there is a teacher in Galesburg that can tell the shrubs and trees there. Now, what are we to do? I believe in school gardens and they ought to be established generally, but in the first place the people must be taught. Our good President yesterday spoke about teaching the children. I say, teach the parents, teach the fathers and mothers of these children, and if you cannot get the fathers and mothers into that thing, in my opinion you never will get the children interested.

MRS. DUNLAP—I certainly think that if we are going to have better instructors along these lines, it is only by agitation of these subjects that we are going to awaken an interest. I like what Prof Standish says about educating fathers and mothers. I believe when you are fifty or sixty years old you can change your methods of

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living and you can go on and learn. We do not want to put it just before the boys and girls, we want to educate the fathers and mothers as well, and we must do it for the sake of ourselves and the coming generation.

MR. FOSTER—It seems to me the answer to Prof. Standish is very simple. If we have not anybody to teach, how can we begin? As for educated fathers and mothers, I may say that I could tell perhaps most of the plants and shrubs he had in his park, my father could not have done it, but no discredit to him. As a boy I was put where I had a chance to learn those things and I know them, and the same way with the children today, if you want them to know these things, put the school garden where they can be in it and instruct them in it. It is not necessary that their fathers and mothers should know; they will learn and become acquainted with these things, and the teachers, if they have to do it, will learn it if it comes up. It seems to me the answer is very plain; start the gardens and put the children in them.

THE PRESIDENT—I want to say a word on this subject. I have had the privilege of passing the garden that Prof. Nehrling had charge of this summer and I passed it every day that I was at home, and I seldom have passed from early until late but I saw groups of children and a large company of teachers. During the summer school the teachers that are preparing to teach all over the State were there and they spent much of their time in this garden learning just these very things, and there was Prof. Nehrling, a splendid fellow, with his overalls and broad brimmed straw hat sowing and planting and he had these little children down on their knees and fixing these beds and everything was as nice and orderly as you could find it in the house, and I tell you they are teaching the children right there and they are doing something and I am so glad of it, because it is less than ten years ago that I had a talk with Prof. Felmley, the president of Normal University, and I told him what I saw riding over the prairies from time to time. I would go past a farmhouse and there they had nice buildings and nice shade trees for their mules and their horses and cattle and hogs, and everything was nicely shaded. Coming up to the school corner, there was a little schoolhouse, not a shrub nor a tree on the grounds, and I said it was a burning shame that these children that come from a distance had got to eat their dinner in that room where the dust and dirt is flying around and attracting disease. I said this to him and you will pardon my referring to my own action, I said to President Felmley, "I am willing to give trees to any board of school directors that will plant them in the State of Illinois and agree to take care of them when planted," and he said,

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"That is a proposition you will probably get tired of," and I happened to be down when the State Teachers' Association met in Springfield and he said to me, "You have got to get up and make that speech to this body of teachers." Well, I was nearly scared to death at the time, but I went up and made the statement and as I passed down the aisle they said to me, "You have got a job on your hands." I will not ask you to guess how many orders I got to furnish trees for these schoolhouses. I got two orders and one was countermanded before the season of shipment came. Such indifference. The very work that Prof. Nehrling is doing at the Normal University is going to revolutionize this kind of thing all over the country.

MR. CAMPBELL—I recently visited different parts of the township and I know in four different school districts there are beautiful trees all around the school houses and in two districts they have started a beautiful little garden so that they are taught how these things grow. Last June I was at St. Mary's School and Dr. Leffingwell took me around the grounds. He is growing on the grounds of St. Mary's School 112 different kinds of trees, plants and shrubs and he can name every one in sight and give its different characteristics. These things are taught not only to the teachers in the school, but all the pupils and the visitors who come there go out into the world, also the pupils that graduate from there and they will tell people what they have seen in St. Mary's School, so that the leaven is working and the good things will become known.

A MICHIGAN FRUIT CROP.

DR. T. J. BURRILL, UNIVERSITY OF ILLINOIS.

I recently listened to the reading of a letter written by a citizen of Illinois to the director of the Agricultural Experiment Station at East Lansing, Michigan. In substance it ran as follows:

"I have recently purchased 320 acres of land in Iosco county of your state and desire to make of it a farm from which a fair income may be realized. I shall esteem it a great favor if you will advise me how I shall best proceed and what kind of farming better be undertaken. I may say that I have never seen the land and do not know much about farming as a business."

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This is a sample of a dozen or more letters read at the same time and the whole were said to be samples of more than a hundred received the last few years, most of them from Illinois, and largely from Chicago. Now, the fact is, the land this gentleman had purchased at the extraordinary low price of seven dollars and a half an acre had never been considered by those best acquainted with it worth anything at all for farming purposes. Everybody knows that the southern portion of Michigan (the lower peninsula) is well populated and the conditions are favorable for richly paying crops, but less is known of the country further north. Much of this latter region was originally exceedingly rich in its forest wealth. It was the home *par excellence* of the white pine,—the most valuable timber tree of the new world. It is usually known that this has been largely cut off and it is natural to suppose upon theoretical grounds that land that has produced a heavy forest growth will produce other vegetation, when cleared up. Much, however, of this white pine land is almost absolutely unproductive for anything else of value and there are great areas, many thousands of acres, in this general region that never grew white pine or anything else of importance. At this time there are 300,000 acres of land, if practically pure sand can be called by this name, in the northern third of the lower peninsula of the state of Michigan that is still for sale by the United States at one dollar and a quarter an acre. It has never been considered by any one worth the price, and no one wants it now at this figure. More commonly this has never been cut over. It never had anything upon it worth cutting under the conditions existing.

Then, the State now has the title to a very much larger area obtained through the non-payment of taxes. In this case the land was entered from the government and has been cut over, but has since been abandoned. In the last five years the State has sold about 800,000 acres of this delinquent tax land at an average of about one dollar an acre, and was glad to get rid of it at less than the cost of keeping the records and advertising. Now, however, a new policy has been inaugurated and the land is in good part to be retained as forest reservations, and it is worth more in this way to the State than it possibly can be to private owners. There are included in the larger area certain tracts which are well suited for agricultural purposes, and these will still be sold for farms, but at a higher figure, perhaps not below ten dollars. Meanwhile the so-called real estate agents will continue to boom coarse sands and gravels as agricultural lands of remarkable possibilities, and suckers from Illinois and elsewhere will buy at good prices.

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Forty or more years ago the growing of fruit, especially on the western lake shore, was greatly exploited. Apples and peaches, particularly the latter, were to bring wealth and luxury to many enthusiasts. Land was sold at high figures in small tracts, often ten to twenty acres, from which families were soon to be able not only to sit each comfortably under his own vine and fig tree, but to live at leisure and at the same time to gain a competence. An observing visitor to the region now will find plenty of evidence that in certain individual cases the competence has been gained, though it need not be inferred that it has come easily, certainly not by simply waiting for it. On the other hand, there is evidence which one who runs may read, that many sore disappointments have been met. A house once an ambitious structure has been left unpainted, and is passing into decay, though perhaps still inhabited, and this with the condition of other structures show well enough that they were built upon imported money or imported faith and that neither money nor faith further stimulate enterprise. This southern lake shore is really well adapted to fruit growing. The man who can and will meet the demands which success requires is sure enough of success, and even of large success, but even the best cultivation sometimes find obstacles which it is impossible to overcome. It is an excellent fruit region, but it is not paradise, and luck can never be taken as a good basis of procedure.

It has been my fortune to spend a few days or weeks in summer upon this west shore of Michigan quite a number of times during the last twenty years. I have taken long drives and longer bicycle rides out from a half dozen of the main centers of horticulcultural interest, and have accounted myself pretty well acquainted with the region and its productions. Having also been widely over the forbidding sands of the north country, I can appreciate the grim humor that lurks in such a letter as I have referred to above. But with it all my visit this last August, to a new locality for me, brought the greatest surprises. This was generally an off year in Michigan for fruit. A wind from the east brought in October of last year heavy snow and a decidedly hard freeze. Never before, perhaps, had the fruit buds so suffered so early in the year, but it is the east winds in winter that are always most feared in this whole region. This time nearly all the peaches south of Muskegon were killed and the apples were also cut very short, except well towards the southern end of the state where in some localities a large crop was harvested. My new region lies north of Muskegon, where I happened to pass a couple of weeks last summer and where I heard of the laden trees up the shore. What was said prompted the journey of investigation, an account of

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which is to be given. Let us first get our latitude and longitude, the better to understand where we are and what conditions prevail.

Oceana county lies upon the eastern shore of Lake Michigan, between Mason county, in which Luddington is situated, on the north and Muskegon county, with the city of that name on the south. Pentwater is the best known lake port in Oceana county. Hart, inland, is the county seat. The county lies above north latitude 43 degrees 26 minutes and has a length north and south of 24 miles, but the shore line is some six to eight miles longer. It is opposite Sheboygan, Wisconsin, or about fifty miles north of Milwaukee. Consulting a map of the lower peninsula of the state we find that except at a point in the extreme south, the shore line bends in this county farthest to the westward, or in other words, the land projects here well into the lake and recedes both to the north and to the south. It is probable that this relation of the land and water has much to do with the results hereafter described, hence special attention is called to it and the nose upon the western profile of the state is pointed out.

The soil is notably sandy, as it is throughout the whole length of the lake shore. Sand dunes piled up by the wind often to astonishing heights are common phenomena of the present shore and farther inland at varying distances, usually for miles, one finds abundant evidences of similar action during preceding ages. There are too, more evident in certain localities than others, many stones from mere pebbles to great boulders, to show the powerful and prevailing effects of the former ice sheet which pushed down from the north during the glacial period, bringing tremendous loads of earth material. The drift here is from 400 to 500 feet thick over solid rock. The glacial deposit is very irregular and varies in composition from a stiff clay to nearly pure sand, and the transitions are often abrupt, so that there may be several kinds of soil on the same farm. but with sandiness as the general prevailing characteristic. Undoubtedly the subsoil too is similarly irregular in composition, having been formed in the same way. This difference in soil over nearby regions showed itself remarkably in the characteristics of the forest growth in the old days before the white man's ax carried its enormities of destruction into the rich woods. Here were a few or a hundred acres covered with almost exclusively white pine, to the great delight of the savage saw-mill man, while perhaps on either side there existed a decidedly mixed growth. To this day, though there may not be a sprout or a leaf to reveal the history, there is pointed out to the visitor "pine land" and "land not pine" in quality. For the most part they are not

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"pine lands" according to the real estate boomer who is trying to engineer a sale. The stumps, however, may tell a different story, for it is now rare to see a stump that is not pine. The others have rotted out since the cutting took place, but the white pine stump is everlasting like the granitic boulders which here keeps it company.

The surface of the country is considerably broken or uneven, especially as it presents itself to a dweller on the plains of Illinois. Besides any unevenness due to the glacial deposits and drifting of sand in wind storms, the action of running water is evident in the formation of the valleys by erosion and this process may still be witnessed to some extent. It is, however, to be noted that the soil does not wash badly. The hills are not gullied anything like what is observed in many other parts of the country with a different texture and composition of soil. With reasonable care slopes may be cultivated here which elsewhere would not be permissible, because the water rapidly sinks into instead of running over the ground.

As elsewhere, on our part of the continent the prevailing winds are westerly ones, and in the winter they are more often from the northwest. The lake is in this latitude much deeper than it is further south, indeed the deepest portion of the whole lake lies northwestward of Oceana county, where 150 fathoms is to be compared with 40 to 50 fathoms elsewhere. This directly explains how it is that the lake does not freeze over in this northern latitude so soon as it does further south. The great railway ferries to Luddington never stop a day in winter on account of ice. It may seem reasonable enough why fruits of tender kinds are more rarely injured here than southward along the lake; at all events this has been found to be true, and the explanation seems justifiable.

Now for some account of what was seen during a too brief visit which could have been more extended with much profit,—August, 1907, the time, Oceana county the place.

Generally there are clear indications of prosperity in the country and in the towns, though there are inhabitated houses that are unkept and dilapidated and there are fields that show well enough the need of more energetic management. It must not be inferred from anything to be said that success here in agriculture or horticulture comes easy, but that really phenomenal results are attained is certainly true. The ordinary farm crops do well. Some farms are especially suited for wheat and as high as forty-eight bushels per acre were harvested this last season. Corn is

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considered fairly successful, and clover yields, at least in some instances, great crops. Potatoes thrive especially well and are often made the chief crop. At Pentwater and at Hart there are immense canning factories, the latter said to be the largest in the world, capable of turning out 200,000 cans per day. These are mainly operated upon peas, beans (string and lima), tomatoes and sweet corn. A great acreage is devoted to peas, and paying crops are almost surely secured. Then, as these are harvested in June, there can be grown on the same land a crop of sweet corn or of late potatoes.

But I am more especially to speak of fruits. It is pre-eminently a peach country and much more attention is given to this than to any other kind of fruit. There are extensive peach orchards with no other fruits near. This is sometimes also true of apples, but there is pretty sure to be a considerable variety if any other kinds are grown. The peaches are of a large number of kinds, ripening with the earliest like Amsden or Rivers, and with the latest after the time for early frosts like Smock. The apples are commonly much less in number of varieties and few of those most popular are such as we grow. Oldenberg leads among early kinds, and as grown here, is considered a good dessert apple. Baldwin takes the place given in Illinois to Ben Davis, and seems to be free from the punky specks common to it elsewhere. Northern Spy is a decided favorite, and Rhode Island Greening is considerably grown. King has more recently been planted and Wagner is sometimes thought to be worthy of selection. I heard nothing of Jonathan, Grimes, Willow or York, but the first at least is probably known to the planters.

To me the greatest surprise was connected with plums and plum-like fruits. Both American and European varieties, but especially the latter, are grown in quantity and to perfection, and there were many of them. Such loads of promising beauty and richness, such variety and robustness,—words can but feebly express what the eyes could not fail to see and what no Illinois man could see without wonder and admiration. It was asserted in my hearing that prunes could be grown as successfully here as upon the Pacific Coast countries, but they can not be dried in the open air. The only Japanese variety which I remember having seen was Abundance, and it showed itself appropriately named.

Cherries had been picked, but they vie with plums in their healthfulness and productiveness. Some one called it the land

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especially of the sweet cherry, and the robustness of the trees with their heavy foliage and depth of color made the suggestion seem appropriate.

Some pear orchards of small to medium extent were seen, but my impression is that this fruit receives comparatively little attention and complaint of the blight was heard. No quinces were encountered. Grapes thrive remarkably and fruit abundantly, but there have never been enough of them grown to attract outside buyers and cold storage at home has not been used, at least this was the substance of a reply upon the subject to a question. There is therefore no complaint of a market for many grapes as things are.

Currants and gooseberries are largely grown and the yields are phenomenal. In both cases the fruit is thinned out after saleable size is reached, and the green berries command good prices in the markets, while those that are allowed to ripen are all the better for the earlier picking. I did not discover many blackberries or raspberries, but some men grow good acreages of strawberries and the results seem to be entirely satisfactory.

So much for the kinds of fruits raised what now about the reliability of crops? If the soil conditions are favorable for all these, how much dependence can be placed upon the climatic influences from year to year. Upon this point my observation can only count for one year. Though the year was elsewhere usually a very trying one, this locality may have happened to escape this time. But tender varieties of trees showed no evidence of former or recent injury, hence some statements which may be quoted from residents are not necessarily open to discount. Here they are:

Benton Gebhardt says he has known peaches and sweet cherries to be grown here for twenty-five years without a failure. C. B. Genung has seen thirty-five years of fruit raising in the county without a skip, and S. E. Fuller testified to the same thing for thirty-one years. W. E. Snyder has a peach orchard seventeen years old since planting. He has missed but one crop in fourteen years. E. D. Richmond has known of fifteen successive crops, and H. W. Gephart of eleven such crops, not all of them full, but in no case a commercial failure. These are now residents and are now fruit growers. They are not real estate agents or speculators. Their testimony seems to be good.

I have at length reached the climax of my story,—that for which all this has been introductory. Do these people make money at fruit raising? Is the chance still open? No one, I am sure,

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will charge me with being a promoter in the objectionable sense of the term. I hope no one will distrust my loyalty to my own state, but he is a poor citizen who cannot see over the boundary lines of his own commonwealth and cannot compare without jealousy or envy other fields with his own. It was esteemed a good fortune that I carried a letter of introduction from Hon. L. N. Keating, of Muskegon, to Hon. T. S. Gurney, of Hart, the county seat of Oceana county. These are both prominent and influential citizens, and I am under obligations to both for favors shown.

The figures I am to quote were for the most part collected by the latter and are mostly estimates made earlier in the season of this year's crops. Those concerning cherries and currants are sale receipts; others are, unless otherwise stated, owners' estimates of fruits on the trees:

C. B. Genung—11 acres peaches, 1200 bushels.

W. J. Bicknell—12 acres peaches, 1500 bushels.

T. A. Bauman—5 acres peaches, 600 bushels; 5½ acres apples, 250 barrels; 1½ acres cherries, $150.

Frank Booker—12 acres peaches, 3000 bushels; 12 acres 3-yr. peaches, 1000 bushels; 7 acres apples, 700 barrels; 3 acres plums, 700 bushels; 1 acre cherries, $225.

S. E. Fuller—10 acres peaches, 1500 bushels; 5 acres apples, 300 barrels; 9 acres cherries, $187 (without cases); 2 acres raspberries, $250.

A. M. Pringle—8 acres peaches, 1000 bushels; 2 acres plums, 400 bushels; 6 acres apples, 300 barrels; 1 acre grapes, 4 tons.

E. D. Richmond—2 acres cherries, $900 (cash on trees).

H. W. Gephart—10½ acres peaches, 2500 bushels; 4½ acres plums, 600 bushels.

C. P. Kinsey—15 acres peaches, 1500 bushels; 10 acres peaches (8 yr.), 2500 bushels.

H. S. Newton—12 acres apples, $2000 (cash on trees); 25 acres peaches, 4000 bushels; 7 acres plums, 1000 bushels; 1 acre cherries, 450 cases.

G. W. Haight is one of the very successful horticulturists of the region. He attends to his business thoroughly and gets his reward in great shape. His farm consists, all told, of 110 acres, seventy of which is in fruit and the trees are of bearing age. He

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had during the year of 1906 ninety-nine different persons on his pay roll and his total sales have averaged for several years about $20,000 a year. From one and three-fourth acres of currants he received in 1906 $1,100 for the fruit and from the same in 1907 he had $1,200. From one-half an acre of Montmorency cherries he sold this year $500 worth of fruit and from five acres of German prunes he received $2,500.

Horace Sessions has 5000 bearing peach trees and 600 well grown apple trees. He received this year from these trees $20,000.

Caleb Davis has on his place an apple orchard of ninety trees on three acres. The apples are mostly Baldwins and the trees, to judge from their appearance, are from seventeen to twenty years old. In 1905 he sold the fruit on the trees for $600; in 1906 for $700, and in 1907 for $800, all in the same way. The last sale was made very early in the year; it should have been for much more money, for there were harvested 1300 barrels, all of which graded No. 1 except thirty-two barrels.

Surely I have gone far enough. A better and a worse story might be told, but it is hard for me to credit my own eyes for anything further, and I wish others to believe the cold statements. I have given two pictures, one of barren wastes, one of amazing richness, yet to a novice the sandy soils are not so widely different in one region from those in the other. It is not surprising that a real estate man should successfully barter one against the other, neither need it be wondered at that some Illinois people prove themselves to be gullible as their opprobrious name suggests. I declare to you the bait looked attractive to myself. But if there is fine looking bait should not one beware of a hook? The hook is there as it is so often in fishing for men. It is true that immense successes have been made and are now in process in this favored horticultural region, but horticulture always means persistent care and intelligent labor. The cry here, as elsewhere, is for efficient help. There seems to be a fair supply of common hands and of even those accustomed to the kind of work in vogue, but close supervision and skillful management are things not usually for him.

Wild land not very difficult to clean up can be purchased from $10 to $20 an acre, and if one knows how to select he may still find as good fruit land as any now in use , but correct selection is needed. One may easily go wide of the mark. Fertilizing is always necessary: the big results are only reached that way. On the one and three-fourth acres of currants above mentioned fifty

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dollars worth of fertilizers are applied each year. The three-acre apple orchard noted receives every year a rich dressing of manure and commercial stuffs. The soil on which these trees grow is decidedly sandy. A sample brought home analyzed 90.05 per cent sand and 2.6 per cent gravel. There may have been clay deeper down, but in some way, for some reason, wonderful results are obtained.

And so it is generally for the region. One is inclined to say at first: "Nature has not done much here for man," but man commands and it is done. How is it done? By brain and by brawn, one quite as much as the other. By all the arts which science suggests, by attention to details, by persistent endeavor, by faith and trust. It requires them all and this is manhood, too, in the making!

Discussion of Dr. Burrill's Paper.

The President—Do you suppose that the land there that you have rated as worthless and think they ought to plant in forestry, do you think that land could be brought up by this same process of fertilizing that was used on this land that you have mentioned?

Dr. Burrill—I have not any doubt but that some of it can, not a bit of doubt, the land that is considered waste now may be made exceedingly productive. There is no trouble there about climatic conditions, no trouble about having rainfall enough or anything of that sort. You will notice, however, that this sand (referring to sample) is very fine; in some places in this region the sand is coarse and so coarse that it will not hold what we put on it. Probably in that very coarse sand they can never raise much of any ordinary crop.

Mr. Winn—What county is that soil from?

Dr. Burrill—This is from Oceana county.

The President—Did you learn anything about the fruit crops in Northern Michigan this year?

Dr. Burrill—No, I did not.

The President—They are having very excellent fruit crops in some places.

Dr. Burrill—I know they had fruit up here in the Grand Traverse region.

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THE PRESIDENT—I went through an orchard right up in the northern part of the State, Mr. Ward's orchard, who has 900 acres in his orchard, and then right in the adjoining county I never saw trees coming into bearing earlier than they did there, that is the county right in the corner, Roscommon county, I saw the trees coming into bearing earlier than any others that I ever saw in my life.

DR. BURRILL—It is entirely possible that there are lands that are begging to go at $1.25 an acre—I cannot quite say certainly, I should say it is probable that they may be made exceedingly profitable when properly managed.

THE PRESIDENT—The Ward orchard is not very sandy, that is hardwood land, it is not settled up very much around it, but in Roscommon county that farm is hilly and quite sandy, and yet I saw as fine apples growing there as I saw anywhere and the man said he has never had a failure, has had no failure this year.

DR. BURRILL—I know they are setting aside in Roscommon county some of this land for forest parks, coming down from this part of the river, they are trying to make reserves along the whole course of that river, not continuously along, but at places along that wide acreage where they are going to try to have forests under the new management.

MR. DUNLAP—I am very much interested in the account that Dr. Burrill has given us of some of the things they have in Michigan and some of the things they have to contend with there, and I will say that equal things might be said along some lines of apple culture for Southern Illinois. It requires, I think, good judgment in planting, cultivating and caring for the fruit. I know of one farm down in the southern part of the State of Illinois that cost $7,000 that has paid for itself three times over, and paid all the expenses of running the farm on off years, in the last seven years that farm has paid for itself three times over and the expense of running, and I think even this year it has paid more than the cost of the farm and the expenses of running. Now that means a wise selection of varieties so that they are properly fertilized and those that will bring good prices in the markets. I think that these profits might be increased by better care, and I think in Calhoun county the same opportunities are offered as down in the extreme southern part of the State. There are lots of lands in Southern Illinois that with the shiftless kind of farming down there bring no remuneration to the owner, and wherever we see an oasis, as you might say, in the desert in that region of poor farming, we see a

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man that understands his soil and takes care of it and who makes money every year, so that with good care and cultivation I do not think any Sucker needs to leave Illinois, to be successful, for sandy Michigan.

WEDNESDAY—AFTERNOON SESSION.

Question Box.

Mr. Dunlap—I have passed these questions around. I will ask Mr. Foster to answer one of the questions.

Mr. Foster—"Would it be advisable to commence winter trimming grape vines and fruit trees as soon as all the leaves are off in the fall?" I should say certainly; the grape vines should be trimmed immediately after the leaves are off in the fall. There is no better time to trim them, that is the proper time to trim them, in the fall of the year. In regard to fruit trees, that depends a little on what you want to do with them, if they do not want much trimming, it will be all right to take off some of the little shoots, but much trimming I should not say was good for the apple orchard just after the leaves fall, it has got to be done in the spring.

The President—Would you consider it an advantage to the grape to cut the strings and lay them down on the ground?

Mr. Foster—It ceretainly is. In case of a severe winter the vine that lies close to the ground does not suffer as much as if it were standing up, even if you do not cover it.

Mr. Standish—Will a Concord vine do better covered?

Mr. Foster—I should not say it would do better covered.

Mr. Standish—Covered or laid down?

Mr. Foster—It is better for it to be laid down.

The President—I asked that question because I do not think we appreciate the value of laying the grape vine down on the ground.

Dr. Graham—"What is the best method of cultivating an apple orchard?" The only way I can answer that is as to what I believe and what I have followed. We had a three-year-old orchard and we had over forty hogs running in the orchard, keeping them out when it is muddy and also keeping them out after the

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trees began bearing so that the limbs hung down and it gave us two excellent crops. The third year I came to the conclusion that it needed cultivation and we turned the clover under. This year it set heavy fruit buds and gave every prospect of a heavy crop, but the frost came in and stopped the process right there. But I believe it is a good scheme. We are going to put the hogs in again next summer, in a fifty-acre apple orchard just beginning to bear, this is the seventh year and they were loaded very heavily the beginning of the season; I have put clover all over it and I intend to let that orchard remain in clover for at least three years and then to keep mowing the clover, putting the clover around the trees and mulching the orchard. After keeping it in clover for three years, I will turn that under. I am going to try that. The Ohio Experiment Station has done that and it looks to me as though it gave the right condition for the preparing of the soil foods of nature, getting them ready to do the work. The soil foods are there, they must be gotten ready, and it strikes me that is a good way to get them ready.

A MEMBER—In sowing that clover under the trees, would not that incline the trees to grow the roots very near the top of the ground?

DR. GRAHAM—The Experiment Station has found after mulching, I believe carrying that on four or five years, that the roots were not nearer the surface of the ground; they supposed they would be, but found to their surprise that they were not nearer, I think that is their report, that the roots were not near the surface. There were some roots near the surface, but there were as many roots tending downward as there were near the surface.

MR. WINN—"What is the best kind of spray pump to use for a ten-acre orchard six years old?" I think for an orchard of that size and that aged trees it would be advisable to buy a Morrill & Morrill all brass pump.

MR. DUNLAP—I think that what Mr. Winn stated is all right, only that I do not believe that so far as the pipe, or the main part of the pump, is concerned, that it needs to be brass. In fact, I have had some that rust out in about five years and are then of no use, and I think that the cylinder part of the pump might just as well be of iron and the working parts of the pump brass. It makes a much cheaper pump, and I think it is just as effective for all purposes.

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PRACTICAL CURE FOR ACTUAL FAILURES IN HORTICULTURE.

A. M. TAYLOR, CLINTON.

To do justice to such an important subject as this requires the knowledge of one that has untold experiences both in the success and failure sides of horticulture, or else he must have profited by the experience of his fellows in a like occupation.

That we may get into the depths of this subject more fully, the writer will give a few instances of what he terms total failure, afterward the practical remedy or cure.

Several years ago a five-acre block of black cap raspberries of the Eureka, Conrath, Munger, Cumberland, Gregg and Kansas varieties were planted in rows six feet apart and three feet in the row, leaving an alley ten feet wide every fourth row so a wagon could be drawn through for mulching and gathering up the trash and brush after trimming and pruning. The first two years in the life of this berry field it was sprayed with a compressed air knapsack sprayer with Bordeaux mixture; the fruit during this period was abundant, of large size, good to excellent quality, and the new canes looking strong and promising for another crop, which developed a glorious bloom, set an abundance of fruit which pushed on to the large green and red stage of their development the following year. At this period of their life they began to dry up and fall off the bushes, and instead of gathering 700 24-quart cases as was done the preceding year, at $3.00 to $3.50 per crate, there was only ten crates which sold for $3.00 each, but were worth about $1.50 per crate, so poor was the quality.

This was a crop failure. Whose fault was it? The husbandman's or God's. Here are the true facts to the best of our memory. God protected and saved them alive through the winter, blessed them with rain and sunshine all through the spring and summer season in the way He knows best. The husbandman mulched, trimmed and cleaned out all rubbish, but that knapsack sprayer was a galling thing to the back and shoulders, hard to get any one to operate it, and the canes had made such a thrifty growth and looked

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so vigorous the spraying was suspended, and anthracnose set in its work in a small degree to all outward appearances but it was enough to weaken the canes, so when the time for them to do heavy work in ripening and sweetening up the fruit, they were not able for the task, leaving them a dead and dried up mass.

Who was at fault? The husbandman, by neglecting or failing to spray, even though it were a galling task.

The practical remedy or cure in this case and similar ones is to set out a new plantation from healthy stock, and instead of depending on a knapsack or man-power sprayed unless it be for the small home fruit garden of a few dozen bushes, procure the best horse power sprayer that will do the work well, then set the plants, in rows eight feet apart, by three feet in the row, leaving the alleys ten feet wide every fourth row, in this way you can use horse power with tools and sprayers so that man's work becomes a pleasure and not a drudge.

In six-foot rows the wheels of cultivators, discs and sprayer cut and bruise the overlapping canes, thus causing great injury and damage; then pickers cannot get through without treading down the canes and berries that overlap the rows, for if your soil is as rich as it is in DeWitt county and you give the proper cultivation, the berry canes will be so strong and large they will spread out so far there will be no space between the rows wide enough for a man or horse to pass through, therefore remedy the fault by setting the rows eight feet apart, then a two-horse Acme harrow or horse spraying machine can be used, and with these improved horse power tools you can accomplish ten times more work in a day with man and horse than two men can in a week with man power tools.

The ambitious young man with limited means will have to begin with less acres and use man power tools for the first year's work, exercising more grit and pluck until he accumulates the required capital to procure the best horse power tools and implements made; however, if he can secure $500 to secure the horses and the tools necessary, go in debt for them. The first crop will pay it off.

Many failures occur with that much loved and sought after fruit, the strawberry, on account of a poor stand of plants caused by grub worms devouring the mother plants. The best practical remedy for getting rid of this dread pest in the strawberries is to fertilize the land sufficiently to develop the berry crop.

One year before you desire to set out the strawberry patch the land should be planted to corn or potatoes. A melon crop is the best. Then plow deep.

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Another failure in my own experience is not marketing the fruit in good condition, especially when the fruit is to be carried twenty-five miles or more. The fruit is often picked too green, likewise the other extreme of picking too ripe is practiced. But more failures occur in the kind of package fruit is packed in. All kinds of paper boxes, wooden ones that are tacked together, have proven utter failures in every instance where shipment has been to market other than the local one. These boxes mentioned will serve for the local or nearby market where you carefully convey the fruit yourself. Shipments on interurban trains have proven to be ninety-three per cent failures. Why? Because the fruit cases have been placed on the front or rear end of the car whose trucks are set back and under a point too far from the end of the car, which causes a swinging and jumping up and down movement to the fruit, injuring and bruising the berries.

The practical remedy for all this failure is to use only wooden boxes well stapled or stitched together, pick the fruit when well colored but firm, and place the cases in the center of the cars, or on those that have the trucks and wheels constructed under the ends; on such cars one position is as good as another.

The saddest failure in all of our horticultural experience is the absence of fruit trees, fruit vines and bushes around every country home. The lack of interest or ambition to acquire or to possess them.

There is not a living being in normal health but loves some kind of fruit, and it is the natural and divine purpose of our Creator that man should live largely upon fruits. Why not accept of the divine plan and fill your yards and gardens with many varieties of fruit?

DISCUSSION OF MR. TAYLOR'S PAPER.

MR. BURROWS—Mr. Taylor and I are the only ones here who seem to be of the same opinion as to education of children. I was surprised to hear the opinion expressed that the proper way to begin to educate was to educate the old people in order to reach the children. That is just simply putting the cart before the horse, according to all the things I know about education. If that is the way, I have been working along wrong lines. I am sorry we did not have that discussed a little more fully, but it is absolutely contradictory to anything I know about education.

MR. STANDISH—I have had probably as much to do with boys and girls as any man in our county, and I think I know something of the laws of psychology and the laws of mind, enough to know

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how to teach a boy or girl, and what do I find frequently? I find that there are parents who, when the teacher has given the child instruction, will go against that instruction and try to prevent the children from following out the suggestions of the teacher. If our parents were better educated, so that they could begin at home when the children are small, before they come to the teacher, if they could be taught at home so that when they come to the teacher, the teacher could carry on that work. I think that is the right process. I believe in instructing the young people and I have done very much of it.

NATURE'S CHEMISTRY IN FRUIT PRODUCTION.

DR. R. O. GRAHAM, BLOOMINGTON.

To the workings of chemical forces in Nature we owe the existence of all forms of matter, except the ultimate divisions, the atoms. Had these forces been absent, the varied forms of matter as we today see them, would have been impossible. Air, ocean and land would never have existed. And of course organic matter, vegetable and animal, would have been an impossibility. Break the chemical force that holds hydrogen and oxygen together in the drop of water, and it is water no longer. Break out by heat the carbon and nitrogen from the wood, and a volume of gases and a mass of charcoal are left. In short, if by the clapping of my hands together I could banish all chemical affinity from this earth of ours, my audience, together with the furniture, the building in which we are, all life, all forms of matter, even the world itself, would instantly disappear, resolved into its primal elements. Wonderful forces are these around us,—chemical affinity, gravity, life, electricity! And after ages of study how little we know concerning them! The reverent student will find employment throughout a future eternity in their study.

Nature and her forces have done almost everything for the fruit grower,—but fortunately not everything. With some kinds of fruit and in some climates, she has done it all; and very unfortunate it has been for the dwellers in these climes. The incentive to labor, one of man's greatest blessings, is absent, and progress is an impossibility. Not so with *our* fruits and in *our* climate, however. Nature has done her part; but she has been careful not to overdo it; and woe is the portion of the sluggard fruit grower who trusts her too far.

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First of all, Nature through her chemistry has prepared for us our soils. In some distant period, the great mass of the earth's crust, freshly cooled from the plastic body, lay on the earth's surface an impenetrable, forbidding covering, wholly incapable of supporting life even in its lowest forms. Then chemistry began her work; and against the surface, and into every minute crevice and cranny she drove her forces vigorously. The atmosphere, the winds, the rains, the oceans became her servants and did her bidding in the performance of the herculean task she had set herself. The oxygen and water penetrated deep into the original insoluble silicious mass, and changed a percentage of this mass into soluble forms; thus honeycombing and breaking it up. The deluging rains of those far away times, the rapid streams, the crashing icebergs, and the dashing waves did the rest; and spread out the crumbled, chemically-changed rock in layers, at first under the ocean waters; later to become the fertile soils which made life on the earth, of any but the lowest forms at least, a possibility, and which nourish and support the grain fields and orchards of today. In giving us our soils the chemistry of Nature had taken the first and very essential step in fruit production.

Probably before soil formation had progressed far, certainly before these soils were to any extent raised from their watery bed, life came in; a new and mysterious force. When and how it came, whether by direct fiat of the Almighty, or by "fortuitous concourse of atoms;"—in other words, whether as part of an omnipotent plan, or as a chance happening,—may be in dispute. But if a happening, then its coming has proved to be the world's greatest happening, as without its presence soils, rock and waters would have remained useless masses, whose creation would scarce have seemed justifiable.

But life came, simple in form and feeble in structure at first; —low plant life, fungi and lichens, as plants alone through the aid of chemistry could feed on the inorganic food supplied by the soils, the waters and the air. Later, how much later we do not know, animal life began; and slowly progressing age by age through untold millions of years, our present fauna and flora are the result.

And here a word concerning the greatest of all chemists in this world of ours, the Sun. From this body go out different kinds of rays, each to do its particular work. Light and heat rays we know best; of the X rays we have heard much of recent years; of actinic, or the active chemical rays we do not so often hear; but they are of extreme importance. By them most important chemical

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changes are wrought; and by their influence the plant is able to prepare its food from the air and to build its cells. As an illustration, the light of a lamp, however bright, will not affect a mixture of hydrogen and chlorin gas, confined in a glass flask; but a flash of sun's rays no brighter than the ray from the lamp will cause an instantaneous explosion. The lamp gives out heat and light rays, but is entirely lacking in actinic rays. Therefore plants will not grow in lamp light.

Perhaps it will make our work clearer if at this point we also explain that *chemical* action always results in the formation of materials differing entirely in properties from the original material or materials acted upon;—in other words, *new* material is formed. For illustration, carbon and water are united to form starch; starch is made to add another molecule of water to its composition, and is thereby changed to sugar; sugar by fermentation is changed to alcohol. Whenever a *new substance* has been formed, it is chemistry that has done the work; perhaps controlled by the life force, but chemistry none the less.

The common fruits of today, the cherry, the plum, the peach, the pear, the apple, have been known as far back as history reaches; and in all the leading languages we find these names. Without question they were far inferior to the same fruits today: and could specimens of these be resurrected and ushered into a Central Illinois packing shed, the strangers from past ages would be glad to take refuge in the cull-pile. It is true the pictures of the fruit eating scene in the Garden of Eden always represent a tree looking much like a thrifty modern Ben Davis, loaded with Jonathan apples. But there is reason for believing that these views were not snap shots taken by the artist on the spot, and there is a possibility of error. Probably the apple was not larger than an Adam's apple; and judging from our knowledge of the character of Nature's production in the apple line today, when left to her own resources, we are inclined to wonder that the man was tempted to his fall, and to believe he told the truth when he said, "The woman tempted me," rather than the apple.

It is probable that by selection of unusual wild fruits, and perhaps by cultivation of these, fruits much superior to the native products had resulted, even in very early times. The apple, for example, probably had its origin in Asia Minor and spread from this center. It was first brought to America by Governor Winthrop, of Massachusetts, in 1629. Planting of the seed of the best trees was perhaps the only method of improvement known, and this, added to cultivation and care gave the apple of a few genera-

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tions ago. Without such care, and without constant upbuilding and selection on the part of man, even the splendid apple of today would gradually but surely degenerate into the crab apple of our forests. Nature stands ready to do much, but she needs close watching.

With the orchardist, Nature's chemistry begins its work when the grafted or budded tree is set in the orchard. The roots first of all send out rootlets, which divide and subdivide, until a network of fibers spread through the soil. They are after four ingredients mainly; nitrogen, phosphorus, potassium and water. The mouths they open to take in this food are small indeed; and the food must be in liquid form. The nitrogen must be in the form of soluble nitrates; the phosphates must be changed to soluble phosphates, and the potassa must no longer be locked up as insoluble silicates. Chemistry must already have done much work on the soil. Part of this work was accomplished by chemical changes when the soil was formed and in the ages afterward; but part is being done constantly. The acids formed by humus decomposition help greatly in this. The air pushing its way in, the penetrating waters, the growth of certain plants, all assist. Under the influence of the life forces, the root fibers themselves exude an acid secretion, a sort of digestive fluid, that aids much. And then the water, an absolutely necessary agent, dissolves this prepared food, the little mouths open to drink it in; and capillary attraction carries it with a force almost infinitely greater than that of gravity, even to the topmost branch of the giant forest trees; and as it goes upward, it loses its load of mineral foods to the tender bark layers, and to twig, leaf, flower, and fruit; until at last, freed from its food supply, the water escapes into the air from every surface pore.

So much for the underground laboratory. Above ground even more wonderful chemical processes are going forward. Myriads of leaves spread to the air a total surface of amazing extent. From this surface the water, that the roots are forcing upward in a constant stream during the growing period, escapes into the air, keeping the tree constantly fresh and bright in appearance. Stop that flow on a warm day, even for a few hours, and notice the change in the tree's appearance. But to throw off water and to be beautiful are not the only or most important functions of the leaf. Four parts in 10,000 of the air in which it waves so freely are carbon dioxid,—carbonic acid gas, as it is usually called,—which is made up of two elements, carbon and oxygen. The supply of this greatest of all orchard foods, water alone excepted, is kept constant in the air by the chemical processes of combustion, decay,

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fermentation and putrefaction of organic dead matter, animal and vegetable. In the presence of the actinic rays of the sunlight the green coloring matter of the leaf, the chlorophyl, has the power to perform a peculiar chemical action, in breaking down this carbonic oxid, letting the oxygen go free; and the leaf through its pores absorbs the carbon. And then another of those wonderful chemical changes takes place; and the carbon just absorbed unites with water and minute portions of mineral matter to form protoplasm, the substance which under the influences of the life force, so marvelously builds up the cell walls, and ultimately the tree, the flower and the fruit, through the deposit of starchy fiber.

How trunk and branch and leaf, bud and flower and fruit, result from the processes mentioned, belongs to the study of life force, and to botany rather than chemistry. Nature's chemistry prepares the foods; capillary attraction lifts these from the soil through every pore of the cambium layer. The leaf drinks in the carbonic oxid from the air, uses the carbon for its cell building, and breathes out the oxygen when through with it. When we understand that eighty-three per cent of the apple, for instance,—and other fruits do not greatly differ—is made up of water, over fifteen per cent of hydrocarbons, as sugar and starch, about one per cent of malic acid, none of which substances have in them any mineral matters, and all of which have been built up from the water and the air, we appreciate how small a part, so far as mass is concerned, the mineral plant food plays in fruit making, since the soil foods, the nitrogeneous products, the phosphoric acid and the potash combined compose less than one per cent;—the first, about four-tenths per cent, the potash approximately three-tenths per cent, and the phosphoric acid not to exceed one-tenth of one per cent. Surely a fruit crop therefore cannot exhaust the soil very rapidly. And yet, though so minute in quantity, chemistry absolutely refuses to build the molecule of tree or of fruit without the presence and help of these minute mineral portions.

It is fortunate for the fruit grower that Nature's chemistry does not stop with the formation of the fruit. If it did this fruit would find no market. When we examine the green apple or plum or pear, we find plenty of tough starchy fiber, lacking in all attractive qualities. But as the season advances, the actinic rays of the sun get in their work; another of those wonderful changes takes place, and part of the starch is made into sugar. At the same time the starchy portions mellow, and become tender, the tough cell walls soften; and in each fruit and in each variety of fruit that particular ether, or ester, is formed which gives to it its characteristic pleasant flavor;—the marked flavor of a Jonathan or a

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Grimes Golden for example; just as like esters are formed in the various wines and brandies, characterizing each of these by its own peculiar aroma. A continuation of this process of change in the juices after these are pressed out, results in alcohol formation, as in hard cider and the various fermented drinks. If still further continued, acetic acid is formed, and the juices become vinegar.

Even then the great chemist's work is not done. The attractive coloring matter must be produced, if the highest results are to be attained. The sun's rays kiss the bright and attractive cheek of apple, pear or peach, more gently and tenderly than the touch of a lover's lips; and at that touch the cheek blushes a lovely red. In some varieties no blush or but a feeble one results, just why we do not know. What causes the red color? The chemical action of the sun's rays without question; but how? Color is all in your eye after all, and not in the apple. The seven colors of the sunbeam, which make up what we know as white light, all strike the surface of the apple. Six of these are absorbed by the blushing cheek; and the seventh alone, the red, is reflected to our eye; and therefore to us the apple is red.

The probable explanation of the phenomenon is this. The apple is made up of minute particles so small that no microscope can discern them. The chemist calls these molecules; and they are the very minutest divisions of the apple that can be made and still remain apple. Each of these molecules *is* apple with all the apple properties. But each is made up by chemical combination of still minuter particles, called atoms, that are *not* apple, but atoms of carbon, hydrogen, oxygen and nitrogen instead, together with traces of potassium, phosphorus, and other minerals. It is these molecules that absorb part of the sun's ray, and reflect others to our eye. It is easy to understand how a slight change in the composition of these molecules, so delicate and so complicated in their structure, would alter their absorbing power, and therefore the color they would reflect. So delicate is color, and so faint the traces of the substances present which produce this, that an analysis often fails to discover these traces. What factors enter into the production of high coloring in our fruits? Quite a number, without question. Among these exposure to the direct rays of the sun, intensity of the light, amount and healthfulness of foliage, soil heat, physical condition of the soil, amount of food stored in the plant, amounts of potash, of phosphoric acid, and perhaps of iron present. Without question the mineral matters must be present; but even if present the color is not produced if the required physical conditions are lacking. And when we understand what

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color is, and how any disarrangement of conditions or of composition of the molecule would disturb proper absorption and reflection of the colors of the sun's rays, it is readily understood why any lack in these conditions or in the proper food supply would cause failure to attain the desired result. Sandy soils seem to favor high coloring of fruit. Clay soils with some sand intermixed seem equally efficient; while apparently our black soils fall low in this requirement. On a sandy loam, with clay intermingled and a clay subsoil, we have at Lilly, Ill., on the Mackinaw bluffs, conditions of food supply and of exposure that result in an attractive coloring of our fruits, which decidedly enhances their market value.

Even while the sun is busily engaged in the formation of the fruit, and in the ripening of this, bringing out its delicious flavors and tinting it with glorious colors, he takes up another task, just as important to the fruit grower—the forming of the fruit buds for next year's crop. To this purpose part of the food he prepares must be diverted. By mid-July the work of fruit-bud building has begun, to continue throughout the season. Should the developing fruit demand too large a share of the food supply, the buds must suffer! and this without question explains why a year of abundant fruit is likely to be followed by a short crop. It likewise gives an added argument for careful thinning of the fruit when trees are overloaded. Some day we shall learn so to feed our trees as to give our chemist a chance to prepare a supply sufficient to meet in full both demands.

As a closing comment, I call attention again to the small percentage of soil food found in our fruits. It would seem that a soil of average fertility should contain sufficient of these foods to furnish the needed supply for many years. But even if the foods are there, we must not forget that they must be prepared for absorption before they can be used. To give Nature's chemical forces a chance to do their work, to supply proper conditions, is absolutely essential, if desired results are to follow. Nature must be aided by intelligent and diligent care. Nature left to herself will slowly but surely change even your boasted Grimes Golden, or your deliciously flavored Jonathan or Aiken, to a close approach to our forest crab in a few generations. The "Call of the Wild" is heard by all cultivated things, whether animal or plant; and all are prone to obey that call if opportunity is given. In fruit growing, as in other things worth the doing, eternal vigilance and intelligent care are the price of success.

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DISCUSSION.

THE PRESIDENT—I am sure you will want to ask the Doctor some questions after hearing this excellent paper. The Doctor is ready to answer any questions.

DR. BURRILL—Mr. President, I am very sure that we should all be very glad indeed to accept Dr. Graham as an authority upon anything concerning chemical matters; it could not be otherwise than that every statement is perfectly accurate, certainly so. I wonder if we are obliged also to accept him with equal certainty concerning Biblical matters, in this company of horticulturists? Perhaps it would be worth while calling attention to the common story about Eve presenting Adam with an apple. For myself, I do not know where the story came from, so far as I have been able to read in those early chapters of Genesis there has nothing been said about an apple, so far as I can get any information, neither Adam nor Eve knew anything about an apple except the apple that is in Adam's throat. It is the fruit of the tree of good and evil. Is that an apple? I tell you we as horticulturists have got to look out for our standing; we are not going to allow the apple to figure in the early history of mankind forever as it has been doing.

After the distribution of a barrel of apples presented by Mr. Winn, the convention adjourned.

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James T. Johnston.

James T. Johnston was born April 11, 1827, in Campbell County, Kentucky, and died in Hancock County, Illinois, April 1, 1907.

Mr. Johnson settled in Hancock County in 1856 and soon identified himself with the affairs of the township in which he lived. Before his death he had filled every township office and was Justice of the Peace for more than twenty-five years.

He was all his life a farmer and fruit grower, and at the formation of the Warsaw Horticultural Society he became a charter member and was almost continuously its secretary. He was a life member of the Illinois State Horticultural Society and a very regular exhibiter of apples at its annual meetings.

He was President of the Horticultural Society of Central Illinois in 1893 and had charge of the Illinois fruit exhibit at the World's Fair in Chicago that year.

For many years he served as expert judge of apples at the Illinois State Fair, and Dr. John A. Warder, author of "American Pomology," said of him: "Truly there are not in all America a dozen men who know so much about the apple as my friend James T. Johnston, of Warsaw, Illinois."

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JAMES T. JOHNSTON

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PROCEEDINGS

OF THE

THIRTY-FOURTH ANNUAL CONVENTION

OF THE

HORTICULTURAL SOCIETY

OF

SOUTHERN ILLINOIS

HELD AT

Belleville, Ill., Nov. 26 and 27, 1907

Reported under Direction of
W. B. LLOYD,
Secretary, State Society.

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OFFICERS FOR 1908.

PRESIDENT.....A. V. SCHERMERHORN, Kinmundy
FIRST VICE PRESIDENT.....J. C. B. HEATON, New Burnside
SECOND VICE PRESIDENT.....A. S. HALSTEAD, Belleville
THIRD VICE PRESIDENT.....G. W. ENDICOTT, Villa Ridge
SECRETARY-TREASURER.....E. G. MENDENHALL, Kinmundy

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CONSTITUTION AND BY-LAWS.

CONSTITUTION.

ART. 1—This Association shall be known as the Horticultural Society of Southern Illinois, and shall embrace the counties of Alexander, Bond, Clark, Clay, Crawford, Calhoun, Cumberland, Clinton, Edwards, Effingham, Fayette, Franklin, Green, Gallatin, Hamilton, Hardin, Jasper, Jefferson, Jersey, Jackson, Johnson, Lawrence, Madison, Macoupin, Marion, Monroe, Montgomery, Massac, Perry, Pope, Pulaski, Richland, Randolph, St. Clair, Saline, Union, Wayne, White, Washington, Williamson and Wabash.

ART. 2—Its object shall be the advancement of the science of Pomology and the art of Horticulture.

ART. 3—Its members shall consist of annual members paying an annual fee of $1; of life members paying a fee of $5 at one time, and honorary members, who shall only be persons of distinguished merit on horticulture or kindred sciences. The wives and daughters of members shall be members without fee.

ART. 4—The officers shall consist of a President, three Vice Presidents, a Secretary-Treasurer, an Executive Committee, which shall consist of the President, ex-President, Vice Presidents and Secretary-Treasurer, all of whom shall be elected by ballot at the annual meeting and shall serve one year from the first of February, 1891, and until their successors are elected.

ART. 5—The Association shall hold annual and other meetings as the Executive Committee may direct.

ART. 6—This constitution may be amended at any regular meeting by a two-thirds vote of all the members present.

BY-LAWS.

ART. 1—The President shall preside at all meetings of the Socity, call meetings of the Executive Committee, and under its direction, have a general superintendence of the affairs of the Society,

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and direction of the expenditures of its money; he shall deliver an annual address, and appoint all committees, unless otherwise ordered.

ART. 2—The Vice Presidents in the order of their appointment, shall act in case of the absence or disability of the President, and shall, by correspondence and personal intercourse wtih the horticulturists of their several localities, endeavor to organize local societies; obtain accurate information of the condition and progress of horticulture therein, and report annually in writing to the Society.

ART. 3—The Secretary-Treasurer shall attend to the correspondence of the Society, keep a record of its proceedings, prepare its reports for publication and shall receive and keep an accurate account of all moneys belonging to the Society and disburse the same upon the written orders of the President, which he shall retain and file as vouchers. He shall make an annual report to the association of the receipts and disbursements, which, with the vouchers, shall be referred to the Executive Committee for settlement. Before entering upon the duties of his office he shall give a bond in the sum of five hundred dollars for their faithful performance, such bond to be approved by the Executive Committee.

ART. 6—The Executive Committee shall, subject to the direction of the society, manage all its affairs.

ART. 7—These By-Laws may be amended at any meeting by a majority vote of the members present.

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LIST OF MEMBERS.

Honorary Members.

Blair, Prof. J. C.....Urbana
Crandall, Prof. C. S.....Urbana
Irish, H. C., Supt. Mo. Botanical Garden.....St. Louis
Lloyd, Prof. J. W.....Champaign

Life Members.

Lloyd, W. B.....Rural Route No. 3, Kinmundy
Tate, Geo. R.....Rural Route No. 4, Belleville

Annual Members.

Ammann, J. F. .....Edwardsville
Anderson, F. P. .....Anna
Barnett Bros. .....159 S. Water St., Chicago
Biebel, H. L.....Rural Route No. 2, Belleville
Beal, L. N. .....Mt. Vernon
Beal, J. T. .....Mt. Vernon
Casper, L. L. .....Cobden
Cooper, S. P., Jr.....Richview
Cope, W. L. .....Tonti
Davis, H. L. .....Creal Springs
Dintlemann, L. F. .....Belleville
Eckert, H. C. & Son.....Belleville
Endicott, G. W. ..... Villa Ridge
Edmunds, Henry .....Belleville
Fehr, A. G., Florist.....Belleville
Fitch, J. N. .....Cobden
Foster, G. J. .....Normal
Fuchs, R. C.....Box No. 74, Belleville
Guy, E. W. .....Belleville

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Goodrich, T. E. ..... Cobden
Halstead, Dr. A. S., Florist ..... Belleville
Heaton, J. C. B. ..... New Burnside
Hinkley, A. A. ..... Du Bois
Hileman, Geo. T. ..... Anna
Hertel, Chas. ..... Belleville
Jinnett, E. R. ..... Anna
Jolly, J. F. ..... Olney
Johann, Henry ..... Collinsville
Kirtland, D. P. ..... Oblong
Laubmayer, C. ..... Odin
Mottaz, Alex. ..... Hardin
Mendenhall, E. G. ..... Kinmundy
Metzgar, E. A. ..... 514 S. Illinois St., Belleville
Neely, Geo. ..... Crab Orchard
Nelson, Wm. K. ..... Marissa
Perrin, J. Nick ..... Belleville
Perrine, W. S. ..... Centralia
Purcell, C. E. ..... Farina
Schermerhorn, A. V. ..... Kinmundy
Stanton, J. W. ..... Richview
Stookey, C. T. ..... Freeburg

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PROCEEDINGS

OF THE

THIRTY-FOURTH ANNUAL CONVENTION

OF THE

Horticultural Society of Southern Illinois

HELD AT

Belleville, Illinois, November 26 and 27, 1907

The Thirty-fourth Annual Convention of the Horticultural Society of Southern Illinois was held in the court house, Belleville, Ill., November 26 and 27, 1907.

The convention was called to order at 10:30 a. m., November 26. President J. C. B. Heaton, presiding.

PRESIDENT'S ADDRESS.

J. C. B. HEATON, NEW BURNSIDE.

The position I occupy today as your chairman, came to me, as most of you know, by the resignation of our worthy President, A. V. Schermerhorn. While I may not be able to preside with the dignity and good judgment of our Mr. Schermerhorn, I hope, with your assistance, to be able to conduct this meeting to our mutual advantage. It is my ambition, and should be the ambition of each one present, to make this one of the best meetings in the history of the Society. We meet today under more discouraging conditions than have confronted us for many years. The apple crop

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has been a complete failure, except in a few favored spots; peaches, cherries and other tree fruits almost as bad. Tomatoes, melons and many other vegetable crops were shorter than usual, but in the main have sold at remunerative prices.

This is the first and only failure of the apple crop for twelve years in that part of our district known as the Ozark hills, and it has taken the conceit out of many of us who have been boasting that we were immune to late spring frosts. I refer especially to the apple crop because it is probably of greater commercial importance in this district than all other horticultural products combined, and when we allow our minds to run back to the cold, frosty, freezing weather which was continuous through the blooming season the wonder is that there were apples anywhere in the district.

Realizing that this failure came from causes over which we can hope to have little or no control, we should the more earnestly turn our attention to some of the difficulties we can remedy.

Our old enemies, the codling moth, curculio and apple scab fungous are not only as active as they have ever been in changing our "Fancys" and No. Ones into No. Twos and culls, but are now being re-enforced by the much dreaded San Jose scale, whose destructive power has been felt by only a few of our number; yet we all are persuaded that "like the poor, he is with us to stay." We realize more than ever, that if we have good apples in the future we must fight for them and the object of this meeting, among other important matters, should be to plan a more effective campaign against these, our common enemies, with better weapons and cheaper ammunition.

Any topic not on the regular program may be introduced through the Question Box which will be in charge of the Secretary, and we urge that it be freely used to develop any matter not otherwise brought before this convention.

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SECRETARY-TREASURER'S REPORT.

E. G. Mendenhall, Secretary-Treasurer, in account with the Horticultural Society of Southern Illinois.

RECEIPTS.

November 26, '06—Balance on hand from 1905-1906	$230 09
November 26, '06—Membership 1906-1907	49 00
December, 1906—Appropriation from State Society	150 00
Total receipts	$429 09

EXPENDITURES.

Total expenses for the year	$195 78
Balance on hand	$233 31
	$429 09

The President appointed the following Auditing Committee, to whom the Secretary-Treasurer's report was referred: Messrs. L. M. Beale, A. V. Schermerhorn and W. E. Eckert. The committee later in the session reported they found the report correct. Their report was accepted.

A motion by W B. Lloyd that Article III of the Constitution be amended, making the price of life membership $5.00 instead of $10.00, was seconded and carried.

ADDRESS OF WELCOME.

MAYOR FRED J. KERN, BELLEVILLE.

Mr. President, Ladies and Gentlemen:—Mr. Dintlemann asked me some time ago to go through the formality of delivering an address of welcome at this convention to the people who are interested in the development and the advancement of the science and art of horticulture in Southern Illinois. I cheerfully consented to deliver this address in the hope that your convention here

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would be profitable and your brief stay with us in Belleville agreeable, more particularly in this county in Southern Illinois than in any other county in this part of our State, as we are more interested in the development and the upbuilding of horticulture than they are in any other county in the southern part of the State.

So far as further growth in an agricultural sense is concerned, we cannot hope to attain it for the reason that practically all of our land, excepting such portions of it as are subject to overflow and must first be reclaimed by drainage, is now under cultivation. This is an old settlement, it is the oldest part, not only of the southern portion of the State, but it is the oldest part of the State, this old St. Clair county to which you have come to spend a few days for the purpose of considering the subject of horticulture.

As a matter of fact, on the question of agriculture the only thing that we can do is to return to first principles and start to make good what we have made wrong. We have robbed the soil until it has gotten so poor that in some parts of the county it more closely resembles a desert than a rich agricultural region. We have got to study the science and practice the art of rejuvenating and re-enriching and fertilizing the soil.

Under the word "Horticulture," as generally understood, is included fruit growing only, but when we look closer at the subject the classification is a much broader one than that. Horticulture does not mean fruit growing only, fruit growing is only one branch of this science. There are four great branches of horticulture, pomology or fruit growing, olericulture or vegetable growing, floriculture or flower growing and landscape gardening. Where are the opportunities better for this sort of development than right here in St. Clair county? All these branches of science and industry in part are dependent for success on close proximity to market, nearness to the great centers of population. We are here in a county that has two great cities, the cities of Belleville and East St. Louis, the two most populous and important industrial centers in Southern Illinois, and we are right at the gateway of the great metropolis, St. Louis. The good that you can do by deliberating on these questions and striving toward development and betterment is inestimable.

In the early part of the history of our country horticulture was only practiced as a side issue. It was in no sense practiced as an industry. We were a new country and the immediate and primitive needs of the people had to be first met, and a man after he had made his little clearing had to go into farming—had to go into something that produced quick results. He went to raising

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corn and wheat, and horticulture became an incident to farming. He had his garden and his little orchard in connection with his farm. But of late years horticulture has not only grown in importance in the way of supplying the American market, but the development of the foreign market for American products, has become quite great.

I regret to notice that while our great State of Illinois ranks about third in point of wealth and population, it comes way down in the list in its rank in both fruit culture and vegetable growing, and it behooves the horticulturists of Illinois to stir up our interest and to arouse more enthusiasm on this important subject. Corn growing and wheat growing and all those agricultural crops have for their future the great expanse of territory in the South and in the West, while in our part of the country the land will from year to year have to be cut up into smaller farms and as we cut the land up into smaller farms, more people will have to go to gardening and fruit growing.

I would rank horticulture as a science and as an art higher than I would mere agriculture. I think you have every reason to harbor a commendable pride in your calling. You have a just right to be proud to call yourselves horticulturists. Along this line of development wonders have been achieved and great things have been accomplished. Take the achievements that have been made by horticulturists in the way of development of the grape. Most splendid varieties they had in Europe when the first settlers came this way and they tried to transplant them to American soil and to develop them,—the Spanish grape and the German grape that grows on the banks of the Rhine, and the French grape. On American soil all the efforts that were made in that direction proved failures. They were unable to get any results from the seedlings and from the plants that were brought over from Europe. The only thing that remained was to take the wild grape plant out of the wilderness and for the horticulturist to put his hand and brain to work to develop a marketable grape from it. That was done and our well known American products from the grape are from vines that were produced from the perfected wild grape.

Another notable instance of development and achievement of the same kind is the perfection of the seedless orange, a feat accomplished by the Agricultural Department of the United States. They talk about great inventions, they say that Edison accomplished a great thing when he invented the graphophone, and he did; that Bell invented a great thing when he invented the telephone, and that Morse did a great thing when he invented the telegraph, but the achievement of these geniuses was not greater,

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although heralded more and given more publicity, than the achievement of the genius who developed a perfect peach, a better variety of apple, a seedless orange. The same in the vegetable line, and the same in the flower line, and the same in the landscape gardening line. I hail these men as public benefactors and I classify them with the great discoverers and with the great inventors of the human race; these men who have given their brain, who have given their hands and who have given their time to development in this most useful and high branch of human endeavor.

There was a brief time in my life when through force of circumstances I was driven to take up the occupation of a fruit tree agent. At the time when I was engaged in that business, judging from the way that some of my prospective victims used to treat me, I felt like apologizing for being in the business, but from my present viewpoint I think that the work that I did during that brief time was about the most useful thing that I did in all my lifetime. I know that those farmers who turned we away and who refused to buy trees from me in that day were the losers by the transaction, and I know that every one who bought trees and planted them—that was about twenty-two years ago—was immensely the gainer by the transaction; has reaped harvest upon harvest on the little investment that he made, and compared to what he made out of the investment, the little commission that I made out of the sale was a drop in the bucket. We ought not to look upon the fruit tree agent with contempt. He is a public benefactor, even if sometimes the nurseries do substitute; they substitute for him as well as they do for the farmers; the substitute is not always a detriment, is sometimes a benefit. In the days when I was on the road, they were all crazy for Ben Davis apples and they all said: "See to it that there won't be any substituting done on us." I believe that almost any kind of substitute was better than to give them the real thing and if we helped him to get a Wine Sap or a Belleflower or a Romanite or a Janet, he really had a better thing after all than if he had gotten the Ben Davis that he was clamoring for.

I cannot impress too deeply upon you my profound respect for your calling and my hope that your convention will be a most profitable gathering. There ought to be more of you here than there are, there ought to be ten times as many of you here as there are. If the people really understood their true interests, instead of your being gathered here in the Supervisors' room, the horticulturists of Southern Illinois would be gathered down here in the Lyric Theatre and standing room would be at a premium. The profit that can be derived from these discussions is simply

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immense. Here we can learn where to get plants and the right kind of seed and how to plant and nourish it and here we can learn how to fight the common enemies, and I believe that mankind is engaged in more commendable warfare when it fights its enemies—the insects—than when it fights its imaginary enemy, the people of some other country. With these few words, I want to repeat the words of welcome that I started out to deliver. I only hope that you will have time to visit some of our public institutions, some of our flower gardens and vegetable gardens, some of our greenhouses and some of our orchards to see the advancement and the progress that has been made in and around Belleville and in St. Clair county. I bid you welcome to the City of Belleville. I hope that your stay will be pleasant and trust your convention will be a profitable one. I thank you, gentlemen.

RESPONSE TO ADDRESS OF WELCOME.

W. S. PERRINE, CENTRALIA.

We are very grateful as a Society for this hearty welcome and I am sure that we will feel at home in Belleville and I also trust that our meeting may be a very profitable one and I think it is true, as our friend says, that there ought to be a great many more here. The people do not realize what they are missing by not coming to these meetings. I am sure it is true that we are engaged in a noble calling, I think it is one of the noblest. The fruit grower can be a many sided scientist and the more sided the better. He can be a botanist, he can be an entomolgist, he can be a chemist and all these will be profitable for him. I for one am not going to be satisfied in making twelve apples grow where only one grew before, but we want to make barrels grow where only one grew this year.

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TUESDAY—AFTERNOON SESSION.

The President appointed the following committees: On apples: E. H. Riehl. On resolutions: Messrs. A. V. Schermerhorn, E. R. Jinnette and L. L. Caspar.

Report of Ad Interim Committee:

TREE FRUITS.

L. L. CASPAR, NEW BURNSIDE.

August 8th your Committee started for the extreme southern part of our district to view the situation and learn what we could from a horticultural standpoint. Arriving at Villa Ridge we drove to the home of G. W. Endicott, where we looked over his orchard and found the trees showing a good strong growth and healthy foliage, but no fruit. On account of poor health and scarcity of help Mr. Endicott was obliged to let the weeds grow unmolested, and judging from their rank growth we could not doubt that Mr. Endicott had by growing clover and leaving it on the land more than maintained its fertility.

After spending the night with Mr. Endicott we were next morning driven by J. M. McBride through the fine young Fanny orchard of Robert Endicott, and judging by the strong growth, healthy foliage and few specimens of fruit found, we believe the Fanny worthy of a place among our best early varieties. There was little twig blight or scab fungus to be seen on this variety. Mr. Endicott being away from home we were unable to get particulars as to cultivation.

At the home of W. R. Crane we found his large Wine Sap trees pretty well loaded with fruit comparatively free from codling moth, worms and scab, but badly stung by curculio, and a most luxuriant growth of weeds showing a strong rich soil. This orchard was not cultivated or mowed this season. Mr. Crane believes in spraying and is equipping an engine to furnish power for next season's work. In our drive during the day we saw many small

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orchards, mostly old trees, all suffering from more or less neglect and mostly past the stage of profitable fruiting. We also noted that peach and cherry growing is practically abandoned and that pear growing will soon follow in their wake on account of blight. San Jose scale is also reported as making its appearance at this point.

August 12 we arrived at Belleville and were met by our genial friend, Mr. Dintlemann, and in company with Mr. Walter Eckert were driven through the fine St. Clair county grain and stock farms to the fruit and vegetable farm of H. C. Eckert & Son, where we saw their fine four-year-old peach orchard of Bequett's Late, Elberta, Greensboro, Mamie Ross and Carman; also some fine young Montmorency, Richmond and Osheim cherry, which they find very profitable. Mr. Eckert is much pleased with Bequett's Late peach and finds Elberta his second best variety. In this orchard as at Villa Ridge, we found the fruit rotting badly. On this farm we found Lankford, York Imperial, Wine Sap, Grimes and Aiken with a fair crop of fairly good fruit. Mr. Eckert practices the sod culture, using the mowing machine to keep down weeds and grass. He is also an advocate of spraying and pruning, having sprayed his orchard five times this season. Mr. Eckert is an enthusiastic horticulturist and does his work well. He is happily situated near a good home market and finds profit and pleasure in his work.

After enjoying the hospitality of Friend Dintlemann over night, we proceeded to look over the fine young apple, peach, pear and cherry trees in the nursery rows, after which we walked through the apple orchards, where we found a good showing of fruit of fair quality on Wine Sap, Rome Beauty, Janet and Pennsylvania Red Streak. Mr. Dintlemann also uses the mowing machine to do his cultivating and did not spray this season.

From Belleville we went to St. Louis where we attended the annual meeting of the American Apple Growers' Congress, after which in company with twenty or more members of the Congress we went to Salem, from where we were driven through the orchard of Dr. Rainey. This orchard contains Rome Beauty, Jonathan, Wine Sap and Ben Davis. Here we found the foliage badly affected by scab fungus. Dr. Rainey also practices sod culture and mowing. There was no fruit of any value; orchard sprayed once this season.

It was in the orchard of Messrs. Swartz Bros. that we were made to realize that cultivation, spraying and pruning are the price of good fruit. In these large orchards we found a good

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showing of nice, clean Jonathan and Rome Beauty, a generous return for the extra good care given the orchard. After looking over the splendidly equipped packing house and cooper shop in which were already stored a good supply of barrels ready for use, we were driven back to town where, after a hasty dinner we took the train for Flora, where we visited the eighty-acre orchard of A. J. Dunlap. This orchard consists of twenty acres Maiden Blush, twenty acres Jonathan and forty acres Ben Davis. We here saw a fine lot of Maiden Blush just ready to harvest; also some good Jonathan, but no Ben Davis. Mr. Dunlap believes in cultivation and spraying.

We next drove through an orchard of Mr. Simpson. Here we saw the splendid fight Mr. Simpson is making in endeavoring to bring a badly neglected orchard back to profitable fruiting by thorough cultivation, pruning and spraying and judging from the improved appearance and good growth of the trees Mr. Simpson may reasonably expect to be rewarded for his labor and expense. In this orchard we saw the first and only bitter rot on a block of Willow Twig, but as there was but little fruit in this orchard there could be but little damage done.

Lastly we visited the large orchards of H. M. Dunlap. These orchards contain Ben Davis, Jonathan, Rome Beauty, Wine Sap, Wealthy, Missouri Pippin, Salome and Lowell, all of which, except Ben Davis, had a good showing of nice, clean fruit. Senator Dunlap practices clean and thorough cultivation and spraying, and t he strong, vigorous condition of tree and foliage prove conclusively that hc is pursuing the right course.

In Union county we find the same general conditions prevalent. A few growers have had some fruit; the majority none. At Cobden and Alto Pass a few peach growers marketed fine crops of Elbertas at fancy prices, while others lost their entire crop by rotting.

We also find Union and Jackson counties alive with San Jose scale, and that some growers are fighting it, while others are giving up and rapidly losing their trees.

In Union and Jackson counties we find more young orchards being planted than in any section visited. Mostly of early varieties. We also found an abundance of twig blight here.

Mr. Miller of Anna, who has about 300 acres set to trees, began spraying for scale November 15, and is testing four different remedies.

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In conclusion the facts that impressed your Committee most are: (1) That enough young orchards are not being planted to take the place of the old ones that are becoming unprofitable on account of neglect. (2) The everywhere prevalence of twig blight. (3) The rapid spread of San Jose scale, and the lack of business methods among growers in caring for their orchards, all of which go to prove that the man who keeps everlastingly at it, and sprays, cultivates, prunes and fertilizes will surely win out in the future.

DISCUSSION OF MR. CASPAR'S REPORT.

A MEMBER—I would like to ask about Mr. Miller using these preparations against San Jose scale, I would like to ask Mr. Caspar what Mr. Miller's idea is in regard to these different preparations?

MR. CASPER—His object in using the different remedies is to make a test of them and to determine which is the most effective. He has not decided himself which is the most effective, he has just been using them this season.

MR. PERRINE—I would like to ask Mr. Caspar why the people seem to universally to have adopted the sod method? Was it because they thought it was better or easier or what? We tried the method of mowing our orchard one or two seasons and we decided it was easier and better to cultivate than it was to mow. We can cultivate an orchard sufficiently we think with very little more labor than we can mow it and keep it mowed, especially in wet seasons when the grass and the weeds grow rapidly.

MR. CASPAR—In some instances they get good results from that method, while in others I think it is due to neglect, or on account of having more to do at that time of year than they can manage on account of shortness of help. In the case of Mr. Crane at Villa Ridge, he has a nice Wine Sap orchard, rather old, but a splendid crop had set and with proper spraying and cultivation and care he might have had a good crop of fruit; I have not heard the outcome of the crop, but from appearances at the time I saw it, I judge he got very little fruit at picking time.

MR. BEALE—Is the ground hilly or rolling, Mr. Caspar?

MR. CASPAR—Not in his case.

MR. BEALE—Well, in any case?

MR. CASPAR—Well, no, in none of the orchards that we visted; most of the orchards that were in sod culture were on level ground.

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In Union county and I think generally in Johnson county the growers believe strongly in thorough cultivation and endeavor to cultivate except on land that is too hilly.

MR. LLOYD—What method do they use for cultivating an orchard on that hilly land?

MR. CASPAR—Well, they use the sod or mowing machine in that, with little cultivation.

MR. LLOYD—Do they carry the stuff off?

MR. CASPAR—No, leave it on the ground as a mulch.

MR. HINCKLEY—I would like to ask Mr. Perrine what he considers thorough cultivation in an orchard?

MR. PERRINE—I would not cultivate as thoroughly as we did a few years ago. We thought in 1902 we had injured our crop of fruit very materially by too thorough cultivation. It is inclined to make the apples drop and since then we have not cultivated as thoroughly as we did that year or the year before. We go into our orchard as we can get to it in the spring and disc three or four times each way. We do not try to disc clear up to the trunk of the tree, we simply cut a strip twelve feet wide each way; we have one disc extended to twelve feet wide and then we follow that with a closed disc, so that we cut a strip twelve feet wide. We do that both ways, in our closely planted orchards we use that method and in our orchards that are planted thirty feet we use the same method. Then we let the orchards rest for perhaps three or four weeks and then we go back to them again and disc them three or four times each way and that is about all the cultivation they get, and we find that method more satisfactory than the constant cultivation all summer.

THE PRESIDENT—Do you mean to say, Mr. Perrine, that you cultivate three or four times before you stop?

MR. PERRINE—Yes.

THE PRESIDENT—And then wait two or three weeks and cultivate three or four times and then quit entirely?

MR. PERRINE—Yes, some seasons we have cultivated later on, if it is dry. One reason we do not cultivate later is, we usually sow to cow peas; we do not get our cow peas sown as early as we would like to, simply because we cannot seem to get to it. Cow peas ought to be sowed about the middle of June, but we frequently do not get them sowed until August. We do not get a very large

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growth, but we got enough growth we think to pay, and sometimes we go through and harrow the orchard just as if the cow peas were not there, over the peas.

MR. LLOYD—What do you do with the land between the twelve-foot strips?

MR. PERRINE—We let that take care of itself. There are some weeds grow up, but not many, the ground is pretty well shaded by the trees. Our trees are headed rather low and we do not prune off the lower limbs, so that the little growth between the twelve-foot strip and the trees even in the thirty-foot middle does not amount to much.

MR. LLOYD—When you sow the peas, do you sow them on that twelve-foot strip or under the trees?

MR. PERRINE—No, we just sow about that distance.

MR. JINNETTE—Do you drill the peas in?

MR. PERRINE—Yes, and we usually sow a little bone meal at the same operation.

MR. CASPAR—I would like to ask Mr. Perrine what he does with the peas after they are grown, whether he mows them, takes them off or leaves them on the ground?

MR. PERRINE—Just leave them on the ground. They do not usually get big enough to mow in our large orchards.

MR. MENDENHALL—In regard to cultivating with the disc harrow in an orchard, I think the best way is to cultivate four different ways. The trees are generally set out so that we can do that and you come pretty near getting every foot of the ground doing it that way, and when it comes to cultivation on hillsides, I think that the eighteen or even twenty-inch disc harrow is the proper one to use, that prevents washing. The larger the disc, the better it leaves the ground in shape if there is danger of washing.

MR. SOVERHILL—I would like to ask Mr. Caspar if he noticed in his trip whether the orchardists that had cultivated the most thoroughly had twig blight. I noticed he spoke about twig blight affecting trees in places.

MR. CASPAR—I cannot say that we did. The blight seemed to be pretty generally in the orchards, both cultivated and uncultivated.

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MR. MENDENHALL—I woud like to ask Mr. Caspar where they found most of the twig blight if there were not pears in the neighborhood?

MR. CASPAR—I would say that there were pears in the vicinity where we found most of the twig blight. At Villa Ridge and Cobden we found it that way and also on some varieties a great deal more than others. On Jonathan down in the southern end of the state we found a great deal of blight. Transparent and Benoni blighted very badly with us and usually on farms where there were Keiffer pear orchards.

THE PRESIDENT—Did not you find the blight on the richest land worse than on thin land?

MR. CASPAR—Well, perhaps a little, yes; although on some very thin land we saw about as much blight as on the rich land.

MR. MENDENHALL—There is one thing in that direction I might say. I had an experience with my Jonathan and Benoni orchards. I had the center of the field set with Kieffer pear and Duchess and the Keiffer pear and Jonathan bloomed about the same time, and the twig blight, I am positive, came from the Keiffer pears to the Jonathan and since I have cut out the pears from that orchard I hardly have had any twig blight at all. I call it the pear blight.

MR. SCHERMERHORN—I cannot resist telling you a little blight story. I had a Benoni orchard and I did not know anything about this cross fertilization or anything of that kind; that they needed to be mixed with other varieties in order to make them good bearers, I supposed they were self-fertilizing, and I set out something like 800 trees and right opposite the Benoni orchard were Keiffer pears, and I manured and cultivated and they grew up and bloomed and by and by they got to blighting, and finally I saw my mistake in having the pears there and cut the whole thing down in one cutting, and the next year the trees began to bear quite a little sprinkling of a crop and have been bearing ever since, and have had very little twig blight. But they were twig blighted to beat anything you ever saw, it looked as if a fire had gone through the orchard, but that cured the twig blight in that vicinity, the cutting down of that Keiffer pear orchard. One thing that made that Keiffer pear orchard blight so terribly was because it did not bear. The bearing Keiffer orchards do not seem to blight like those that do not bear, and the reason they did not bear was because there was not another tree within half a mile of them.

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MR. PERRINE—We have had a similar experience. We had forty acres of Keiffer pears and apples mixed, and the pears kept blighting worse every year and finally the apples began to blight badly. I think our York Imperial blighted back as much as a foot or fourteen inches on most of the limbs, and the following winter we cut the pears right out and we have had no blight in the apple orchard since. It has been two or three years ago.

MR. SOVERHILL—Can any one cite an instance where the twig blight has eventually killed a tree, or does it always outgrow it? Does it kill an apple tree?

MR. SCHERMERHORN—I think not.

THE PRESIDENT—I have had some Yellow Transparents that might just as well have been dead, they were near it from twig blight.

MR. LLOYD—They are as good as dead so far as bearing qualities are concerned.

MR. SCHERMERHORN—Oh, there is no question about that.

THE PRESIDENT—One point in Mr. Caspar's paper I was hoping some one would bring out, as to cultivation on hillsides. We all know how the land will slip away from us if we cultivate and it is generally conceded that it is best to cultivate an orchard, now, the question is, will the cultivation on hillsides, the benefits derived from it, overcome the washing of the land according to your observation in your trip? Would you recommend cultivation on hillsides, or just let it alone using sod culture and the mowing machine?

MR. CASPAR—I believe in that case about the best method would be to endeavor to grow clover on those hillsides and use the disc on that clover two or three times in the spring in order to give them a start, and then allow the clover to grow and mow. Of course it is pretty hard to grow clover in the state of Illinois.

MR. SCHERMERHORN—Correct the acid condition of the soil, that is the first thing to do.

MR. HERTEL—I do not know how we can use the disc to loosen the soil much and maintain the clover. I think a harrow would be the thing to cultivate the clover without injuring it. It seems to me the disc when slanted enough to pulverize the soil to do any good would also destroy the clover roots.

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MR. CASPAR—The practice of growing clover in an orchard and discing as mentioned is practiced by Mr. Endicott of Villa Ridge, and I must say his orchards certainly showed that the clover has benefitted the orchard. The trees are making a fine growth in spite of the fact that the weeds had grown three or four or five feet high in the orchard, it was almost impossible to get through, but the trees had a fine dark foliage and were making splendid growth, and that is the method pursued by Mr. Endicott in the past years. On account of bad health and inability to get help he was unable to disc and mow his orchard as formerly.

Report of Ad Interim Committee:

BERRIES AND TRUCK.

E. R. JINNETTE, ANNA.

With instructions to pay more attention to berries and truck than has been done heretofore your committee started August 8 at Cairo, and worked north along the Illinois Central.

For years Cairo was the center of an extensive and profitable trucking business. Large quantities of lettuce, radishes, beets and early cabbage were grown on land inside the levee. But this land has been absorbed by the railroads entering the city, and the truckers have about all gone out of business.

No loyal Ad Interim Committee of this Society would think a trip complete without a visit to the veteran horticulturist, G. W Endicott, the sage of Villa Ridge. We found him quite feeble from months of illness, but just as wide awake and enthusiastic as ever on horticultural matters. Though hardly able to walk he took us to his berry fields. Gandy and Aroma are the only varieties grown. His spring planting was in fine shape, and the runners were just starting. In September Mr. Endicott wrote us that his strawberries were making very few new plants, and that he could not account for it. We found the same conditions at other points, and it is all the more strange in view of the excessive rainfall during the growing season. Rex and Miller are Mr. Endicott's favorite raspberries, but he has been watching the performance of the Manitou, under test at the experiment station, and he is so favorably impressed with it that he will plant quite a block next year.

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In company with J. M. McBride we visited a number of Villa Ridge farms. Like most of his neighbors Mr. McBride formerly grew a good deal of truck, but he has cut out everything except asparagus, raspberries and strawberries. His berry fields were remarkably clean, and showed every indication of thorough and persistent cultivation. A block of twenty acres of Miller and Rex raspberries were a beautiful sight. The large stalky canes, and the dark green foliage were evidence of a robust, healthy growth. Cow peas had been sown between the rows, and they were about ten inches high, and a perfect stand.

We also visited the experiment station which is in charge of E. J. Ayers. The most promising thing at the station is the Manitou, a new red raspberry, which has fruited two years. Mr. Ayers says it is a good shipper, a rank grower, very prolific, and a far better table berry than the Miller. We saw but one patch of melons at Villa Ridge. These were planted in the open ground about the middle of May. The vines had made a fairly good growth, and were free from rust, but the wilt was doing considerable damage. The melons were netting, and an average crop for the season was in sight.

Strawberries, raspberries, and asparagus are the main crops at Villa Ridge. Gandy is the leading strawberry, and Miller and Rex the leading raspberries. The methods of the principal growers in preparing the land, and handling these crops, while growing are worth recording. They are as follows: Land intended for strawberries is sown to rye in the fall. In the spring the rye is plowed in, and cow peas sown. When the peas are ripe they are picked and the vines plowed in. The land is then ready for berries in the spring. Raspberries are planted in rows ten feet apart. Thorough cultivation is given till about the middle of July, when the cow peas are drilled in between the rows. In the fall the peas are picked, and the vines left on the ground over winter. In the spring as soon as the land is dry enough to work the pea vines are worked into the soil with a cutaway harrow. Besides adding humus to the soil these methods help to keep the land free from weeds, and save quite a bit of cultivation

After planting Mr. Endicott uses no manure on his asparagus. Instead he makes liberal applications of dissolved bone, and potash in the spring. Then as soon as the cutting season is over he gives the asparagus a good cultivation, and sows two bushels of cow peas per acre. The peas keep down the weeds and grass, and do not interfere with the asparagus. The pea vines and asparagus tops are left on the ground until late in the winter, and then dragged

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down and burned off. This plan gives good results, and does away with the heavy, disagreeable work of hauling and spreading manure, helps to keep down weeds and grass, and holds the rust in check.

There is not much doing at Ullin in the way of fruit and truck growing, although the land seems to be adapted to the business. Some Gandy strawberries and various kinds of truck are grown. But aside from the staple farm crops, more attention is paid to sweet potatoes than anything else. The "sweets" had been well cultivated, and gave promise of a good crop when we were there.

Dongola is located in the hills seven miles north of Ullin. Quite a good deal of fruit and vegetables are shipped from Dongola, and the output is increasing every year. Like some other points, Dongola has two shipping associations when there is not enough business for one.

At Balcom the growers are concentrating all their energies on melons, cucumbers, and spinach. The little striped beetles, lice, rust and wilt levied heavy tribute on melons, and the yield was far below that of last year. Still the growers have made money. How much money some of them have made on cucumbers Mr. Plott's paper will show. One hundred and fifty cars of manure will be used on the truck patches around Balcom next year. This is more than has ever been used in one season, and it means an increased acreage. Nearly all this manure is shipped in from St. Louis, and the average cost is not far from twenty dolars a car laid down at Balcom. The growers are wild on cucumbers, and every little patch of bottom land as big as an ordinary town lot has a pile of manure beside it, and will be planted in cucumbers next spring. By sowing spinach on the land as soon as the melons and cucumbers are off Balcom growers get two crops a year. In this way a growing crop occupies the land the year round.

At Anna and Jonesboro both berries and truck are grown. Clyde, Dunlap and Bubach are the leading varieties of strawberries, and Miller the favorite raspberry. Winter onions, rhubarb, asparagus, cucumbers, tomatoes and melons are all grown in considerable quantities. T. P. Sifford has fifty-five acres in strawberries at Anna. They are mainly Dunlap and Bubach with some Gandys and Excelsior. He has one twenty-acre block planted last spring that is superb. The plants are matted rows just thick enough plants to insure a heavy crop of big berries next spring. Near by is a block of eight acres of as fine Miller respberries as were seen in all our rounds.

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C. M. Miller has sixty acres in asparagus, and forty acres in Miller Reds. Most of the asparagus, and all of the raspberries are growing in young orchards. Neither has made a vigorous growth. The asparagus in the orchard was badly affected with rust in August.

Cobden used to be a great shipping point for tomatoes and strawberries. Tomatoes are still grown extensively, but rhubarb and asparagus have largely taken the place of strawberries. When asked the reason for this a Cobden grower said: "It became so difficult to get sufficient help to cultivate and pick strawberries that we were compelled to take up something else. I can cultivate my asparagus and rhubarb without hired help, and both crops are harvested at a time when it is comparatively easy to get all the help I need." Sweet potatoes are the leading truck crop at Cobden, and immense quantities are stored and shipped out during the winter. About half as many were raised this year as last.

August 12 your committee went to Belleville, and with Messrs. L. F. Dintlemann and W. E. Eckert for chaperons made a tour of inspection among the farms. To our surprise we found that little attention is paid to raising truck and berries. What, with such rich land and nearby markets, the business could certainly be made to pay. However, we did find blackberries, strawberries, Rocky Ford melons and grapes on H. C. Eckert's farm. The blackberries were Snyders, and they had made a fine growth, and were quite free from rust. The melons were planted in the open ground the last of May. The ground was covered with a dense growth of vines, and some wilt was observed, but there was no sign of rust. But the vineyard was the thing that attracted the "berry and truck" end of the committee. It was very evident that it had been handled by an expert. Not a weed or spear of grass could be seen. The foliage was abundant and healthy. Owing to the late frosts the crop of fruit was light. Mr. Eckert has fruited the R. W. Munson two years, and he thinks it by far the best grape of the Concord variety. He considers Beacon and Brilliant the best of the Munson collection.

Discussion on Mr. Jinnette's Paper.

Mr. Foster—I will ask Mr. Eckert if the Snyder blackberry is the only blackberry he grows, and if so why? I supposed some other kind than the Snyder would have been more profitable to him in St. Clair county.

Mr. Eckert—We have tried about twenty varieties of blackberries within the last ten years and we always thought in buying

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a new and promising variety that we had something to beat the Snyder, but when it came down to actual results, to the money end of the question, on good strong land, such as we have here to raise blackberries on, we found the Snyder after all to be the most profitable variety we can grow. We get a very large berry, cultivate it very thoroughly. If you get a good strong cane, you get a good berry in the Snyder. And another thing, nearly all varieties bought elsewhere simply brought the rust on our place and destroyed the patches. We have a triffe over an acre of Snyder planted a half mile away from all our other blackberries and from this patch of practically an acre of blackberries, we sold $215 worth of berries wholesale this season. Blackberries were a fair price this year. We got these plants from another grower in this town that had no rust, and we set them entirely away from other blackberry patches, and that patch is free from rust, and whenever we bought other varieties of blackberries, we always got rust and it was only a matter of a few years that we had to do away with all our blackberries on acocunt of rust. We are free from it now, and are going to propagate our patches of blackberries from this patch of Snyders, not allow any other plants to come on the place.

MR. HERTEL—I am not in the berry business now to any extent. Some years ago, when I was in the berry business, that is the blackberry business, I was quite successful wtih the Early Harvest. One year I sold $367 worth of Early Harvest berries from one acre patch. We have now a small patch of Early Harvest and Snyder. Early Harvest are much more satisfactory than the Snyder; we get more on the same number of bushes if they are properly managed. They are very large and ripen until the very last one. They come earlier to the market. We consider it a much better canner than the Snyder, they have a smaller seed and come on the table in better shape; the Snyder will come onto the table in a mushy condition. I have level land and the soil is different from Mr. Eckert's. I would grow more Early Harvest than all the others combined. I have a variety now that will come in bearing this year, transplanted from Kansas. They come as early as the Early Harvest, a very promising berry. I tried nearly all other varieties when I was in the business and the Early Harvest was the money-maker with me and people who were formerly my customers have asked me again and again if I could not furnish them with Early Harvest at least for canning purposes.

A MEMBER—My experience with blackberries is about the same as Mr. Hertel's. I have grown the Early Harvest and Snyder side by side, and in every instance I have found that the Early Harvest will beat the Snyder almost two to one. I have a patch of Early

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Harvest that has been growing on the same ground for about fourteen years and I have never missed in that fourteen years a good crop of Early Harvest, and they will outsell any berry in this market on acocunt of their quality as a canning berry. They have very little seed. If I were to go to growing berries, I would make a specialty of Early Harvest in St. Clair county. It would not make any difference to me what kind of land I had, because I have grown them side by side with other varieties and they have always been the money-maker for me. I have never taken any pains to know how much money I could get out of a half acre or acre of blackberries, but when I came to compare them with other varieties I have grown, they beat them all two to one. So far as the Snyder is concerned, unless the ground is very fertile and you have a great deal of moisture, if you get a hot dry spell, they will not ripen the fruit, they will dry up on the stalks. That has been my experience. It is never the case with the Early Harvest.

MR. HERTEL—I will give my mode of cultivation for either Snyder of any other variety. After the bushes have been planted, for two years I cultivate thoroughly and the second year I ridge them slightly. Then that winter we manure profusely, put in manure three or four inches deep right between the rows. In the spring we haul about five or six inches of old weathered straw on top of that. I pursue that method for twenty-five or more years and I have been invariably successful. I pruned pretty heavily in the spring, or about June, cut off the tops so as to get laterals, cut those back about fourteen inches and in that way there is no labor whatever required and the patches remain clean. I have not had rust for at least five years.

MR. ECKERT—I believe some men can make a success with the Early Harvest, but I cannot for the life of me advise any one to plant it and say that they are going to have a success for the simple reason that while one or two men will make a success of the Early Harvest, ten or twelve will make a failure. We have tried the Snyder. We have always found that we could not keep the rust down with the Early Harvest, no matter what we did, and for that reason we discarded it. Furthermore, we found that if a patch of Early Harvest was in the neighborhood, and the same was true with the Erie and some other varieties, if there were patches of those in the neighborhood of the Snyder, it was only a question of time until the rust would get the Snyder. We have had no trouble for the last two years. We practice most thorough cultivation on our blackberries, the same as Mr. Jinnette reported as to the way we run our vineyard. We have high, rich soil, and every other year or so we apply barnyard manure heavily, and

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if the land is rich and cultivation thorough for the Snyder, there is no danger whatever that the hot weather will burn them up. You all know the past season and the season before this were the two worst seasons for the blackberries. We have had extreme heat, 100 degrees or more at the time of ripening, and I am sure we have had the most successful crops the last two years we have ever had, and I believe while success can be made in growing Early Harvest, few would be certain of making a success as Mr. Hertel has. One is running a great chance with it. I believe peculiar soils and locations have a great deal to do with growing Early Harvest successfully, and I would not run the chance of growing Early Harvest when I can make a success of Snyder. But you cannot grow Snyder successfully unless you grow it on good rich land and give it thorough cultivation. It is the freest from disease and the hardiest. We have tested all the varieties that have come out in the last ten years and we have not found any that we would discard our Snyder for.

MR. JINNETTE—A few years ago nearly everybody in the southern end of the State grew blackberries, especially was this true in Union county and the Early Harvest was the berry that grew, but I think we did not see a single patch of blackberries south of Belleville. There is a patch near me of the Early Harvest, but they have been failures for the last two or three years, the rust took them and the price went down, and as to quality, I think the Early Harvest is a miserable thing. As we grow it, it has a hard core in it, and I suppose, as Mr. Hertel says, if we cook it, it will not go to pieces. You will have to cook it a long time to soften that core, and it is sour, nearly as sour as rhubarb, but it is the only berry we can grow; it is a good carrier, because it has that core in it. But no blackberry is grown with us now except it may be for home use.

MR. REIHL—I wish to say that, like the gentleman who has just spoken, I am not particularly partial to the Early Harvest for the same reasons he mentions. It is by no means a berry of good quality, no one can claim that. It is more in appearance and quality like a mulberry than it is like a blackberry and with us it is bitter, and I think north of us it is bitter. Possibly farther South it can be grown, and as has been reported, can be grown successfully, but we have no use for it whatever and have tried it several times. While on the subject, it will perhaps be interesting for me to refer to some of the new varieties which I have tested recently in my Station. [Mr. Reihl has charge of the State Society's Experiment Station at North Alton.—Secretary.] The one which seems most promising at the present time is the Ward. It has

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fruited the second time this past year and I must say it is one of the finest things we had in the Station. The berries are very large and the quality is that rich, spicy flavor peculiar to the wild berries that you find in the woods. We have another, the Eldorado, and it is extremely hardy, productive and a quality as fine as you could possibly wish to find. We have fruited a great many of the others, but on too small a scale to determine their value. The Blowers is one, another is the Leda and one called the Price. All these we fruited for the first time this past season, and all seemed fairly promising, but one year's test is not sufficient to be able to say much about it.

Going back to the report, referring to Mr. Eckert's successful grapes, it is a little surprising to me that he should be so successful with the varieties mentioned. The R. W. Munson, the Beacon and Brilliant have all been discarded with us some years ago. The R. W. Munson is not productive enough, the Beacon sheds from the bunch so that it cannot be called a market fruit, and the Brilliant, although of the very finest quality, has a very weak leaf and is not satisfactory for that reason.

MR. JINNETTE—I would like to ask some of these blackberry men, have any of you ever seen or tried the Himalaya? The reason I spoke of that is, I saw some of that variety in California last winter and I took some home with me and they are growing. I saw some canes fifteen feet long, trained on a trellis like a grapevine, saw them fruiting. The man of whom I got my plants claimed he sent them to all parts of the country. I asked him if he thought they would stand our climate, and he said that they were found in the Himalaya mountains as high as anywhere in the world. They made an enormous growth with me, vines twenty to thirty feet long, the vines stood last spring, whether they will stand the winter I do not know, but they are immense berries and they are exceedingly fine quality. I was wondering whether you had seen or tried them. They are blackberries, pure and simple.

MR. REASONER—I have the Himalaya that I received from California, two or three vines. They make a tremendous growth, run out to an incredible length, but mine all winter killed.

MR. SOVERHILL—Am I to conclude from Mr. Eckert's report that after the rust has once made its appearance in a blackberry patch that he will abandon the patch?

MR. ECKERT—That is my idea. If the rust once gets a good start in a blackberry patch I would not give five cents for the

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patch. It is only a question of time when the patch is settled. I think most blackberry growers will agree on that. In regard to the Eldorado blackberry, we tried it several years ago. It is a fine variety, but is subject to the rust so badly that we discarded it after using it several years. We found it is as bad for rust as the Erie, and the Erie is certainly bad enough. That is the reason we discarded it, otherwise I liked the variety very well.

MR. TATE—Mr. Eckert says his method is to abandon a patch when he finds rust has got a good start. The proper way is not to let the rust get a start, that whenever you find a plant affected, grub it out and burn it and you can keep it down. I have fought the rust in the Early Harvest berries for fourteen years and I had as fine a crop last year as ever grew. In regard to Eldorado, I do not know whether I know what it is, but my understanding of it is that it is very thorny. I will admit the quality is all right, but when we raise berries, we raise berries to get money out of them as well as to have some to eat, and I tell you it is a hard matter to get pickers to pick the Eldorado berry. I have abandoned it particularly on that account, you cannot get anybody that will pick them for a reasonable amount of money per quart. I have grown the Kittatinny; I found that the berry is not prolific in this country, I did not get a paying quantity of it. I have raised it a great many years and never got a paying crop, where with the Early Harvest I always get a paying crop. Another thing in growing a berry you want to grow one that is suitable for the market in which you expect to sell it. I think the Early Harvest will bring more money than any variety we might raise. We have quite a successful berry grower here who has grown berries in this county for quite a number of years, and I would like to hear from Mr. Lantern.

MR. LANTERN—My experience is about the same as that of the rest; we cannot do anything with anything else but the Snyder That is the only berry we ever made anything out of.

MR. RIEHL—In regard to rust, I think it is not right to condemn a variety because it rusts, and I have reason for making this statement. When the Mersereau first came out, the first season of fruiting was so very fine that I thought we simply had a bonanza, it seemed there could not be any improvement upon it, but next year it rusted all to pieces and was discarded, taken out completely. A year later new plants were obtained and the new planting made of the same variety for a certain test, and since that time there has never been the least bit of rust in it. In regard to the Eldorado, it has never rusted; no one in our vicinity has seen a rusted Eldo-

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rado. One of my neighbors has made more money out of that than anything else he has ever grown. It is thorny, there is no question about it, but the difficulty in picking is fully made up in the additional price you get for the berries in putting them on the market, it brings a higher price on our market at Alton, a local market, than any other berry that grows. Referring to early varieties, the Early King is the best with us. It has that wild flavor which we all enjoy, and another is the Illinois. The Early King and Illinois are decidedly the best varieties we have ever tested.

MR. SOVERHILL—I did not catch Mr. Riehl's idea of getting rid of the rust; I did not catch what he wanted a man to do in case he has the rust.

MR. RIEHL—I simply stated that it was not wise to condemn a variety because it rusted. It is all right to get rid of that plat or that row which you had planted, to clean that up entirely, but it is not right to say that that variety is of no value, because it happened to rust with you, because the rust might have been in the plants when you purchased them. It is a hard thing to control, I will admit, but the way to keep it down is to cut it out just as soon as you see it, and I am not in favor of grubbing it either, because when you grub out a plant, you are simply making a lot of root cuttings which are going to grow up again, but simply cut it off at the surface and keep cutting it off as it grows up.

MR. ECKERT—I would like to ask Mr. Riehl if the Early King is a profitable bearer? We have had Early King for ten years and we have not had a profitable crop yet, side by side with other varieties. There is no other berry that I would like better than the Early King, but we have never grown a profitable crop of it.

MR. RIEHL—That simply shows that berries are peculiar in their nature, and possibly have succeeded in one place and not in another, because with me it is a very heavy bearer, it is as productive as any variety ever fruited, and another thing about it, while it begins to ripen before anything else, before the Early Harvest, it holds on so long, you can pick it for weeks. It is very satisfactory as an early bearer and the Illinois comes in just after it, and also very successful, but the Early Harvest is different from them in that it ripens its fruit all at one time.

MR. LLOYD—Now, let us get at the difference in the soil of the two men, what soil did you raise those berries on successfully?

MR. RIEHL—We have a clay loam, a rich clay loam.

MR. ECKERT—We have the same soil.

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MR. HERTEL—I wish to say a word in defense of the Early Harvest. I hope you will admit that our people have some taste, we have good cooks, good housewives, I hope that you will admit they have some taste in the matter, they know what they are buying. With us the Early Harvest has a core as luscious as any part of the berry, and the berry itself is one of the richest flavored that I have had any experience with. Some people will pay fifty per cent more for Early Harvest than other berries.

MR. STUPPE—I will help defend the Early Harvest. We grow the Early Harvest and we grow the Snyder, and it did not take me long to find out which was our money maker. We get one-third more for our crop of Early Harvest, they come in early and we get much more money for them on our market than we do the Snyder. We had as fine Snyders as any one here, but we did not get near as much money for them as we did our Early Harvest, and as Mr. Tate has said here, we grow for what is in it, we do not grow it for the quality altogether.

MR. MENDENHALL—I have been listening to this Early Harvest discussion, and I believe I have had as much to do with the introduction of the Early Harvest as any one, in fact, I was one of the first to handle it on the market, and it was originated within about two miles of my place, and there has been a great deal said about it. Mr. Riehl, I believe, talks about its flavor and he probably has been eating it when it was just colored up. The Early Harvest turns black long before it is ripe, hence that makes it one of the very best shipping berries we have. When it gets into the market, it is in pretty good shape to eat. There is not a berry that I know that I can ship alongside the Early Harvest, that is, for standing up qualities, and I know it will bring a good price in the market when it comes in in any kind of shape.

THE PRESIDENT—After all, I suppose each will probably plant and raise his own favorite.

MR. OGLE—I have a berry that came from California which they call the Logan berry. I would like to ask whether that is the same berry as the Himalaya?

MR. JINNETTE—No, the Logan berry is a hybrid, it is a cross between the blackberry and red raspberry.

MR. TATE—I would like to ask Mr. Riehl which he thinks is the best berry, the Manitou or the Cardinal?

MR. RIEHL—They belong to different classes; the Cardinal perhaps stands the best among the purple; it grows as do the blacks

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and propagates from the tips, it is a cross between a black and red raspberry and we call them purple. The Manitou is a red variety, distinctly, which propagates from suckers. While on the subject, I will say that that is easily the best red raspberry we have ever had; there is no such thing as comparing another variety. I am speaking now of the Manitou; it is the best thing we have ever tried in every way. It is a strong, vigorous grower, healthy in every way, very attractive and the best shipper we have ever had and in quality there is nothing that will beat it and in size it is large enough, one of the largest. There is another which I want to recommend to you and that is the Worthy. It is particularly good in quality, productive and in every way a successful red raspberry for early growing; the Manitou is late, from medium to late. That and the Worthy make a very good combination, the Worthy ripening very early and the Manitou coming in medium and lasting a long time, covering a long season.

A MEMBER—Can you tell us something about the Beedler raspberry?

MR. RIEHL—It is one of the best varieties we have ever had, one of the late varieties, it originated in Virginia. There is another red raspberry which we are not quite familiar enough with to say just what its value is, but it is simply very interesting owing to its immense size, the Iowa. There is nothing I have ever seen like that, fully twice as large as any other variety we have ever seen, but it is inclined to crumble a little, which is not in its favor.

APPLE GROWING.

CHARLES HERTEL, FREEBURG.

MR. HERTEL—My experience in apple growing has been a successful one for a period of fifteen years, I have not failed in that time in getting good returns from my orchard. This year my crop is abundant as usual and I received excellent prices for it. Varieties that for years have not borne, bore this year. The Romanite, Pippin and some Grimes Golden that have not borne for years in an orchard that was put out in 1862 and that is in a good state of preservation, those trees formerly had borne for years, but had not borne heavily; this year they bore a good crop. I have planted a few orchards. One of them is in best bearing now, about eighteen

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years old, another six years old, just beginning to bear. In planting an orchard a person should prepare his soil beforehand. I believe that nothing is better than to plow a good rich sod to plant an orchard in. Such a sod I would create in two years. I would sow in timothy and red top in the proportion of one pound of red top to four pounds of timothy, sowing eight pounds to the acre. Next spring I would mix one pound of alsike to one pound of red clover, sow eight pounds of that to the acre. The first year the crop is mostly red clover, that disappears during the winter and the second winter we have a dense crop of red top, timothy and alsike, a growth dense enough to produce two and one-half tons to the acre. That is my preparation for corn also. I have followed that some twenty-odd years and my neighbors will testify to the fact that I can grow some of the heaviest crops of corn on such a field that can be grown. We are husking now at the rate of eighty bushels of corn on just such land. This sod should be plowed up in the fall previous to planting the orchard; in the spring it should be disced or cut up with a spading harrow or cutaway and the ground finely pulverized, then the holes should be dug, or furrows drawn both ways, meeting in the square where the tree is to be planted, and the hole enlarged, of course the surface soil placed near the roots of the trees. I prefer spring planting. After the roots are well covered we follow with water, loading several barrels on the wagon, profusely watering the soil, just covering the roots; in the evening after the water has thoroughly soaked, or next morning, we place the soil on the surface and after a few weeks tramp it. This water soaked soil imbeds itself closely around the rootlets and gives them a chance to take hold of the plant food. You all have had seasons when after tree planting we have had excessively dry weather, no copious rains for months at a time, and these roots would stand in the soil without coming in close contact and the young trees would not do their best, the foliage would be small, but by supplying your abundant moisture at once, the roots are in elegant condition. I have planted hundreds of trees in a single season and I have not lost a single one, and I have invariably followed this method, even if a wet season is promised; and we are not sure of that, and we follow this method and it has always insured a crop of trees.

Some years ago I received a consignment of peach trees from Mr. Augustine; he told me before they were sent that he was out of trees at his home nursery and would have them shipped from Kansas. When they arrived they were wilted and shrunk to such an extent that the men would not plant them. They said, "Those trees are dead; they are shriveled; there is no use planting them." I said, we will make an experiment with them. I never heard of

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doing it before. We made a bed of weathered straw, placed the trees on the straw, covered them up with eight inches of straw and gave them a perfect soaking, saturated the straw, covered them with wagon sheets, left them in there about twelve hours, and at the end of four days the trees looked plump and full again. My men laughed and said, "Well, you can also swell old pine timber, but that is all the good it does." I realized the trees were not dead; that only the water evaporated, and if I placed it in again it would help the trees. They all grew. They were not dead, of course, but I do not believe they would have grown without this assistance, they would not have had vitality enough without it.

I have seen young orchards planted this fall, and invariably I have seen in every instance full tops left. Now, I believe that is not good. During the winter the wind sways them. I cut them back in the fall, not quite as far as in the spring. I follow that up even in spring planting. I see that farmers sometimes leave the full top. Now, if we give that matter any thought, we know that taking up that tree has destroyed the greatest number of fibers; no matter how careful we have been, the small rootlets or fibers have been destroyed, the tree must start from its own vitality; it lives by its roots, and to begin to gather up nourishment this large tree surface will give large enough evaporation and the root system is not there in comparison to the requirements, and the tree dies, at least there is not much growth made. If it had been properly trimmed and balance established between the root and top, the tree would have grown. I remember on the Carlisle road I saw a tree suffering from that condition. I stopped and drew the attention of the man to the matter, and hepruned those trees and the trees got a new start and it is a fine orchard now. I believe if I had not given that advice the trees would have died, or would not have made any growth.

In planting trees I would prefer what we call whips. I do not believe in forks in apple trees, some varieties especially will break down when they get to bearing. I had some very fine varieties of Belleflower and they have nearly all gone to pieces by splitting. By growing whips, or cutting the trees back to whips, letting the plant start from the center stem, there is no danger of breaking down and splitting.

After a young orchard is planted it should be thoroughly cultivated. I have no objection to growing a few crops of corn and potatoes if the fertility can be kept up, but the orchard should be cultivated. I prefer the first few years to have a corn crop, because the hot sun does not strike the tree so directly as without the corn.

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However, if a tree is in full thrift I do not believe the sun will hurt it much. To some people the sun scald is just because of the rays of the sun. It may be, but it is because the tree is enfeebled, it has not the full supply of sap under its bark, and then sun scald and insects take hold of it. When trees begin bearing, I would keep up the cultivation but not cropping. Keep up the cultivation with the cutaway disc until the latter part of June or middle of July, then I would sow my orchard into stock peas. I have had considerable experience with them. I think I grew the first stock peas in the county and I have not discarded them. They are not indigenous to the soil, and they will keep the soil exceedingly loose and porous. Cultivation is aboslutely necessary for the production of good crops and maturity of wood.

In 1901 we had an excessively dry season and people feared for their fruit crops. We kept up the cultivation and had a constant mulch in our orchard, and we have never had a finer crop of peaches and a more abundant crop of apples than we had that year. Peaches were more luscious and finer than we ever had them before or since. It was an exceedinly dry season; by keeping a dust mulch on the surface the moisture was preserved under the trees, and our soil has a clay subsoil and moisture comes up from below. Surface cultivation also has the effect of forcing a downward growth of the roots. The downward growth is caused by the fact that there is moisture in the soil, and the roots penetrate downward to get that moisture; thus they have a greater area for food, where in the orchards which are not cultivated, they come to the top and they are subjected to the extreme drought and wet.

About every three or four years in a bearing orchard I would sow a crop of stock peas. Clover does exceedingly well in land seeded by stock peas. These stock peas I would mow after they had attained to the height of about eight inches. Leave the mulch on the ground; next crop I would permit them to freeze off. I never found it profitable to raise stock peas for the seed, or clover for seed. I think most farmers make the mistake in producing seeds of stock peas, or clover. I think it a good investment to leave the material on the soil. I would not remove a crop of clover from the orchard, but would mow it at least three times during the season and just let the mulch remain. That mulch then performs the same purpose that the dust mulch performs when the orchard is cultivated. If you crop your clover field too heavily, that is, if you pasture it with stock, hogs or anything of that kind, or cut the clover or hay, you have a bare surface and evaporation will go on pretty much the same as it would in soft soil: with stock peas it is different, because stock peas keep the soil exceedingly

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loose. Both of these crops add to the surface of the mulch and add humus to the soil of which the soil stands in need. When the trees are in full bearing, give the orchard a good dressing of stable manure about every three years. I mentioned a while ago that the orchard that was put out in 1862 or 1863 is still in good bearing. The same varieties I mentioned have borne for some years, but other varieties that have not done well in other orchards do well in that orchard, and the trees are in a good state of preservation yet. This is near the house, about two acres; that has been in orchard grass for twenty-five or more years. Now, I believe that orchard grass has a different effect on the orchard than sod grass of any kind. The sod grass gives a solid, hard surface, extracts exceedingly much moisture from the soil, is a good harbor for insect enemies. Orchard grass, if it is mown about three times a season and then left on the soil, gets in between the plants and serves as a mulch, and I find that the orchard is constantly loose; being near the house, the chickens are in it a great deal and scratch around in that mulch; it is always in a fine condition. never becomes hard, and the trees do not seem to require the plow; so if we sow any grass in the orchard I would sow the grass fitly named orchard grass. In sodded down orchards the roots of the trees establish themselves near the surface and depend on the summer showers only two or three inches in depth, that would be as low as the roots would penetrate, and depend on this moisture in that depth. Sometimes our winters are blamed for the death of the trees, the severe winter. I believe it is the summer drouths. If we have an early summer drouth the wood ripens rather early, the tree ceases its functions and the wood ripens early. Then sometimes we have a lot of fall rains and the trees begin to grow out wood again and go into the winter not fully matured at the time the winter sets in, and they are in bad condition to go into the winter; by keeping up the surface cultivation, keeping up the growth of trees constantly, we secure the natural growth and development of the wood when we cease cultivating about the first of July, or perhaps about the tenth of July; from that time on the tree will mature its wood well and it is safe to go into the winter. I think the injury to the fruit trees is not from severe changeable winters, but from the extremes of summer weather. Those I think can be counteracted by the method I have described. I am speaking of this matter from observation and from experience.

I forgot to mention in regard to the varieties of trees I grow, that depends of course entirely upon the object of the orchard. When I planted my orchard I planted for the purpose of making a local market orchard, and I planted a certain number of trees of different varieties, beginning with July and endeavoring to have a

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succession of ripe apples until the winter apples are gone. I have been successful in that and we have an excellent market in Belleville for that purpose. There are very few summer apples about Belleville. People discarded them fifteen to twenty years ago. Formerly the orchards in this vicinity were orchards of summer apples and the supplies were too large and the price realized was too low for years. I have not sold apples on an average below eighty cents; for the first ones we would realize one dollar, and $1.20, and keep up the dollar price. This year of course the prices were much better than they were ever before. I started out with a dollar, thinking that was a pretty good price, but finally reached $1.50.

Of course eternal vigilance is the price of everything, and it is in the orchard. We have sprayed our orchard for fifteen years. I think Mr. Helps and I were the first men in the orchard business that practiced spraying and purchased spraying apparatus. I think Mr. Eckert followed us afterwards, but we have sprayed for fifteen years with one exception, that exception was three years ago. My sons had not fully believed in the virtue of spraying and I thought, well, I am going to let it go this year and take what I get, and I certainly did take what I got, but I did not dare to put some of the products on the market for fear I would injure the reputation of my apples, so our Jonathans were turned into cider; we did not have a barrel out of six of salable Jonathans, and before that and since then our Jonathans have been perfect and so it is with other varieties.

The black rot started in the orchard about five years ago, but by constant spraying and vigilance we have gotten rid of every semblance of it. I do not know what the future will bring, but by constant spraying we certainly were able to subdue the black rot and bitter rot. My orchard is the picture of health today. I saw years ago in attending the agricultural meeting at Springfield photographs that were shown by friend Dunlap of the difference between sprayed and unsprayed trees of the Willow Twig, and although they were but pictures you could see the difference, and my experience has shown me that that difference exists just to that extent. A neighbor of mine, Mr. Biedler, and I own spray apparatus together; we both have had exceedingly fine crops of apples this year, and have had, as I said, for fifteen years. I do not attribute it all to spraying, but a great deal of it. We were of course protected from the Northwest by a heavy growth of fine black oak timber, but I believe if buds and trees are full of vigor, just like full of animal life, they can stand more extremes than they otherwise can. The leaves are the laboratory of the tree in which the buds

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are prepared, if they are not in healthy condition, the tree will not be able to perform its functions well. It is necessary for the foliage to be in perfect condition, just green and shining and every vein in good condition, and that is the way we try to keep our orchard. I know it takes work to keep it in that condition, but it is worth a great deal if we consider the results. The extra price received from such an orchard pays fifty fold for the work expended.

In my capacity as superintendent of schools I have a great opportunity of speaking to the young people in regard to these matters, and I gather the boys and girls around the schoolhouse and in the spring I carry my pruning knife along, showing them how to prune and bud, and I hope that the next generation of orchardists will be more wide awake than our present generation has been.

THE PRESIDENT—As the next paper is on the same subject and will cover so much of the same ground, we will postpone discussion until after we have heard that paper.

Mr. Jinnette took the chair and Mr. Heaton read a paper on

SOME OF THE ELEMENTS OF SUCCESS IN COMMERCIAL APPLE GROWING.

J. C. B. HEATON, NEW BURNSIDE.

I shall not attempt to advise, but rather to call attention to some of the problems that have been worked out in a practical way by some of our up-to-date orchardists at an enormous expense.

In apple growing it takes a long term of years to learn, definitely, the practical working of a theory. The result of any system of management cannot be seen on an orchard the same year; for example, cultivation given an orchard one year has but little effect until the following year, and so it is with other things.

We want to keep in mind that in apple growing we are doing a long range business, and that we cannot with good reason expect quick results. We must also remember that disease works slowly in trees. A diseased tree that has in it the seeds of death and decay, may, if planted in an orchard , grow for the first few yearrs with all the vigor of a healthy tree, while at the same time the disease is growing with the growth of the tree, and when we see a stunted growth followed by a heavy bloom the following spring,

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and an immense crop of little hard apples, we know that tree is doomed, and we are not surprised when we see it wither and die before the summer is gone. Sometimes four to six trees to the acre over the whole orchard will do this, and we are caused to wonder what can be wrong. We may get so anxious about it that we will dig up the tree and carefully examine the roots to find if possible the cause of death. If we had used the same care examining the trees before planting we would have discarded this one and in its stead planted a healthy tree, and thus avoided the loss. If one will take the trouble to figure the loss sustained, when a nine to twelve year old tree dies (this being the age of greatest loss) they will more fully appreciate the importance of greater care in selecting trees to start with. One not only loses the first cost of the tree, the use of the land, the care and cultivation, but that for which there is no remedy—the long years of waiting, the blasted hopes and bitter disappointment. If those vacant places in our young orchards, just beginning to bear, could be filled with trees as far advanced and as vigorous as those near by, what fabulous prices we would pay. In many cases the tree is not only dead, but the ground where it stood is poisoned, and a healthy tree planted in the same place is liable to die with the same disease, at about bearing age. Even though the trees should live and grow we can never call back the wasted years, or in any way repair the loss. The importance of starting an apple orchard early in life cannot be too strongly emphasized. It takes an average of seven to nine years after planting an orchard, even with favorable conditions, to get paying crops. In this fast age, an extra year or two waiting for an orchard to bear amounts to much, and in planting an orchard one needs to exercise the greatest possible care in the selection of his trees. First, one wants to make sure that the trees for his future orchard have been propagated and grown in a way that will give them a strong tendency to early and continuous bearing. Millions of dollars have been lost in the last few years because of carelessness and ignorance along this line. The cry of the tree planter has been cheaper, *cheaper,* CHEAPER, with no thought of any other quality than cheapness, until nurserymen have been forced to a system of propagation and management, in the effort to supply the demand for cheapness, that has sacrificed other more important qualities. The great craze for orchard planting through the middle west dates back about twenty-five years, reaching its height about fifteen years ago. A large per cent of these orchards were planted by men who knew nothing about horticulture. They wanted a big orchard and wanted it as quickly and as cheaply as possible. With them a "tree was a tree." They seemed to think that all one had to do was to plant the trees, wait a few years and gather

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bountiful crops of high priced apples. They planted, they waited, but a large majority of them have failed to gather the high priced apples.

During this craze, nurserymen had to work over time, and resort to every conceivable short cut in making and raising trees to supply the demand at prices to suit the purchaser. Many large orchards planted about this time have never borne even one good paying crop of apples. Our University and Experiment Station men, together with some of the most successful orchardists, have spent much time in observation and thought, trying to ascertain the cause or causes of such failures to bear, in localities where, up to this time, orchards had been noted for continuous, bountiful crops of apples. The conclusion come to is, that the effort of the nurserymen to supply the demand for cheap trees by using year after year, scions and buds from the nursery row, and scion blocks, weakens the constitutional tendency to fruit bearing, and is largely responsible for the failure.

At the present time this matter of barren orchards is attracting the attention of scientific horticulturists more than ever before, and they are being forced to accept the old theory that the scion or bud produces in the future tree a tendency to bear heavy annual crops, or to make rank wood growth, as the case may be, with the tree from which it is taken, as surely as it produces the same variety, color, flavor of fruit or any other distinctive quality of the mother tree; hence the importance of making sure that the trees are made right, cannot be too strongly emphasized. Next in importance is to see to it that every tree going into an orchard is healthy, vigorous, and free from fungous disease and insect enemies. The diseases and insects most difficult to contend with are those which attack the tree under ground, such as root and crown gall, strawberry root, hairy root diseases and woolly aphis.

One wants to keep in mind that the very best tree that can be made is none too good and that the first price of a tree is only a trifle compared with the care, cultivation, use of the land, and long years of anxious waiting for results. When a diseased tree is planted we should know that the disease will grow with the growth of the tree, and when the strain of fruit bearing comes the tree being already weakened, goes down under it. It has been the custom of agents and those having charge of tree deliveries to call the attention of the purchaser to the nice smooth, well balanced top, but they seldom open up the bundles to show off the roots, and if they do they will brag on the fine bunches of fibrous roots, never once intimating that they are the result of a disease that

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will in the course of time kill the tree. If lumps or knots are discovered they will contend that they are of no consequence, and will soon grow over. If you would be on the safe side reject everything that looks suspicious.

Thirteen years ago I planted a block of about one and one-half acres to Early Harvest. At that time it was difficult to secure Early Harvest apple trees in any considerable quantity. Finding a nurseryman who could furnish me the required number, I bought them.

When the trees came they looked all right, only many of them had knots on the roots and crown. Some of these knots were as large as hickory nuts, others had a bunch of fibrous roots similar to strawberry roots. At that time I knew but little of trees and their diseases. I was assured that these trees were all right and I planted them with the following results: First, I learned some valuable and expensive lessons. In addition to learning that these knots were root and crown galls, I afterwards ascertained that these trees had been propagated with scions from the nursery row for many generations back. I learned that the trees not only died out rapidly, but that those which have survived the root and crown gall, after thirteen years of patient waiting, have not borne so much as an average of one-half bushel per tree for the whole time, and this too from a variety noted as an early and persistent bearer. About one-half of the original planting is dead.

We will figure the loss on this effort to get an orchard. Seventy-five trees at ten cents per tree, $7.50. The use of the land after the trees were six years old at two dollars per acre per annum would be twenty-one dollars for the one and one-half acres for seven years. The care of the trees at one dollar per acre per annum for thirteen years would be $19.50; total, $47.50 for the one and one-half acre being $31.32 actual cash loss per acre, not taking account of the long years of anxious waiting, and all because I did not know how to commence right.

There is such a thing as being too particular in many things, but one cannot be too particular in rejecting diseased trees when planting an orchard. We would not hesitate to brand, as very foolish, the stockman who would buy and feed diseased animals because they were a little bit cheaper than healthy ones. Yet almost every apple grower has been guilty of the same kind of folly in planting diseased trees.

The wise man in erecting an expensive building uses more care in laying the foundation than in any other part of the structure.

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So it is in growing an orchard. The trees are the foundation, and should be the best obtainable, regardless of price, the land for the orchard is the building site. High rolling, comparatively level land that can be easily cultivated without washing into gullies is the best; however, most any kind of upland in this country will make a good orchard site, but steep land is more expensive to handle.

The distance between the trees should vary according to the fertility of the soil. The stronger the land the greater the distance between trees.

My experience is that an orcard planted 28x32 or 28x34 feet with a filler of some early variety planted in between, the wider way, gives best results. Yet many of our best orchardists object to a filler on the plea that the average man will not cut it out at the right time, and that it will in the end do more harm than good. Each planter must decide this for himself, and if afraid of the filler system the distance should be 28x30 or 28x32 feet for the wider spreading varieties, such as the Wine Sap, Ben Davis, Black Twig, Stayman Wine Sap, Maiden Blush and others of their general type.

Yellow Transparent, Duchess, Ingram, Benoni and other varieties with an upright habit of growth should be planted much closer one way, say every twenty feet in rows twenty-eight feet apart. This distance makes it easy to get through with a spray outfit. The trees should be planted with the surface roots four to six inches below the level when the ground settles. Those on the hill side should be planted deeper than those on level land as the soil on the hillside is constantly being washed away.

The strongest roots should be pointed toward the southwest. And the tree leaned in that direction, because of the prevailing winds in the spring when the ground is soft, which will in time bring the tree to an erect position. If you would have the tree grow off vigorously pack the soil firmly about the roots; if tamped with a heavy maul, so much the better. There is no danger of getting it too firmly packed. Put no fertilizer of any kind, or rich dirt against the roots but fill in until all the roots are covered with the same kind of soil in which the tree is expected to grow, then put on your manure or fertilizer.

For the first three or four years very little pruning is necessary. Let all the limbs grow except water sprouts, cross limbs and forks. When the tree is three or four years old in the orchard it should be pruned to a permanent shape, and kept in shape by

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persistent pruning until it gets to bearing heavily. Don't make the mistake of cutting out the short spurs and feeble looking limbs in the center of the tree; they are the fruit producing growth and if taken off are never renewed. This mistake alone has cost me hundreds of dollars in loss of fruit.

On good, fairly level land, the orchard may be planted to corn and peas alternately until it has attained the bearing age; the peas being pastured with hogs; the vines left on the ground to supply humus to the soil. If growth is too rank at five or six years old, sow to clover and stop cultivation, which will check growth and encourage the formation of fruit buds. Then plow under the clover and cultivate the orchard with no other crops growing. This applies to good fairly level land. Steep, rolling land needs quite another kind of treatment. It should be sowed to clover at the time of, or before planting the orchard, and for the first three or four years should be cultivated near the trees only. The cheapest way to do this is with a light plow, working a strip about three feet wide on each side of the tree row, allowing the plow to dip into the ground about four feet from the tree, and continue in the ground to about four feet past the tree. The plow should then be carried to within four feet of the next tree and the same process repeated through the orchard. When finished each tree will stand in the center of a cultivated spot six by eight feet, the object of this skip plowing being to prevent the ground from washing. If one continuous strip is plowed on hilly land, the water from the whole field collects on these strips and soon makes gullies. The clover should be cut three or four times each year and allowed to remain on the ground.

At the end of four or five years the ground should be plowed deeply, except near the trees, which should be plowed shallow enough to not disturb the roots, and cultivated one year to corn, followed by rye and clover. This rye should not be allowed to mature its grain, but should be mowed just before the grain passes the milk stage, and left on the ground for a mulch. After this, each spring, the whole surface of the orchard should be cultivated two or three times with a cutaway set at half angle, so it will dig up the soil and not destroy the clover. The only way to prevent washing of steep land is to keep it in clover or some other growth, which cultivation with a cutaway will not destroy, but will keep healthy and vigorous. This treatment followed by mowing two or three times each year, everything being left on the ground for a mulch, will give most satisfactory results. Great care should be exercised at all times, when cultivating an orchard, to stir the ground as deeply as possible without breaking the tree roots. Deep

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cultivation encourages deep rooting which is very desirable. Mutilating large roots gives access to disease and decay. Cutting off large limbs does the same thing. When it becomes necessary to remove large limbs, the better way is to cut them off two or three feet from the tree, just beyond a small limb. This small limb should be left on the stub to keep it alive and growing, preventing the entrance of destructive fungous into the body of the tree.

In addition to the cultivation, pruning and other care, the spray pump comes in for a share of attention. It is your means of defense against insect enemies and fungous diseases, and should be ready at all times for effective use. One spraying at the right time is often worth a whole season's cultivation. This has been the case this year. Where not sprayed, young trees both in orchard and nursery were greatly damaged by apple scab and black fungous.

This paper has special reference to the care of an orchard up to bearing age, and may to the uninitiated seem to advocate somewhat elaborate and expensive methods, but not more so than the results to be obtained will justify. It is a matter of impossibility to get the best results from an apple orchard, and at the same time be robbing the soil of fertility, by removing year after year other crops. Such a system will soon exhaust the soil until you will only get a poor crop of either, and a poor crop of apples of poor quality is almost equal to no crop. The time has passed when it pays, in the apple business, to grow anything but the best.

DISCUSSION OF MESSRS. HERTEL'S AND HEATON'S PAPERS.

MR. PERRINE—Mr. Heaton speaks of the apple scab fungous and the black apple scab fungous. I would like to know what he means.

MR. HEATON—I cannot explain it scientifically. I noticed a few days ago in my nursery, on the Wine Sap and Kinnard's Choice, on the young trees, a kind of black fungous substance on the young twigs, and the leaves began to curl and drop off, the growth stopped, and I sent a sample of the twigs to Prof. Burrill, and he called it black fungous and said it was only in un-

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usual seasons that it did any damage to the growth. This year I noticed the same thing in the young orchard and in the nursery row and the growth was checked entirely on my orchard for about four or six weeks in the time when the best growth is expected and consequently I got very little growth on my young trees, and the same is true in the nursery, the leaves curl before the season for the perfecting of the leaf; they curl up, dry up and drop off the tree.

MR. PERRINE—I had a small block of about three and one-half acres that acted the same way as Mr. Heaton's this last year.

MR. KLEIN—The gentleman spoke about what I consider very important and that is getting started right, to get the right kind of tree. Now comes the question, How? How do you know when the tree is what it ought to be, and when it is not what it ought to be?

MR. HEATON—My experience with nurserymen is that they are, as a class of business men, as honorable, open and free in giving information about their methods as any people I have ever mixed with. I am speaking of the real nurserymen, and to get a tree as I say that is grown right I would want the tree propagated with scions from bearing trees and if I could get it, I would prefer it from trees that are noted for bearing good apples and plenty of them, and then as to the roots, I want them clear of knots, hairy roots and what is called the "strawberry root," and any insects that would be damaging to the tree. I would want to get a fumigated tree, that is about the very best thing that a man can just now depend upon. I would not care anything about the size of the tree or the shape of the tree.

MR. HERTEL—Deal with responsible nurserymen that you personally know, or buy from an agent that you personally know that deals with responsible nurseries and do not buy from these sharks that represent wonderful things.

MR. PARSONS—I would like to ask Mr. Heaton whether he has any remedy for the "strawberry" root on trees or anything of that kind?

MR. HEATON—Yes, throw them away. If I had twenty-five cent apple trees and half of them were afflicted with "strawberry" root or hairy root or crown gall, I would just throw every one of them away and plant good ones. I would have just one-half as much ground to work over and have finally as good results.

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MR. PARSON—What if they had been planted several years?

MR. HEATON—Well, I had this Early Harvest orchard that I referred to. After discovering just what condition it was in, I went in with another lot of Early Harvest trees that were all right, and planted in between, and I think by the time they get to bearing, these others will all be dead. I do not know whether they ever will amount to anything or not.

MR. PERRINE—I think Mr. Hertel has been very successful with his orchard. I think his management of it has been very wise, most excellent. His success in getting fifteen successive paying crops, I think he stated, is very remarkable. If most commercial orchards could get such results as that they would be doing much better than they have been doing. I think one reason of his success is partly due to one thing that he did not bring out, and that is his large number of varieties. He has quite a number of varieties in a small orchard, consequently he has very good cross pollination. We have one little orchard block planted with probably ten to fifteen different varieties, and we almost never fail to have apples in that orchard, and I think it is largely because we have that large number of varieties. The same varieties in our large orchard blocks some years do not yield at all, where at the same time in a small orchard those same varieties may be loaded with fruit, and it is largely a question of cross pollination.

MR. HERTEL—I forgot to mention also another agent that assists in cross fertilization, and that is my apiary that is in my plum orchard. Since about 1885 my trees have been bearing in my plum orchard, and I have not missed a single crop of plums in eighteen years, and I believe my bees have helped in my fine production of apples every year. They are right near the orchard and every day when there is sunshine they are out and at work. They go right to the plum trees, I have observed that, and I think that is to a great extent responsible for the production of apples, this fertilization and cross fertilization. I wrote articles on cross fertilization thirty-six years ago and was hooted at. I wrote for the Prairie Farmer and people looked at me and laughed, and said that was all folly, that things went along all smoothly and nicely long before I wrote of cross fertilization. But if I were to plant a commercial orchard, I would only plant two rows of trees of one variety and then another variety and then mix them in. It would be a little more difficult to gather them, but the results would be better.

MR. SHERMERHORN—How many hives of bees have you lost by this process of spraying?

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MR. HERTEL—My neighbor sprays with me and we have it understood that no spraying is to be done during the full bloom. There is no need of it; there is no danger that any insects will get into the calyx at that time and my neighbors believe in what their neighbor who has had experience tells them and we do not spray. We spray the naked tree in March and spray after the petals have fallen. Some of my neighbors think my bees are a nuisance, or did think so, at the time of making apple butter. but now they realize that they are a help.

MR. HEATON—I would like to ask Mr. Hertel if I understood him right with reference to saving seed from stock peas and clover. Do you mean to say that peas and clover seed are worth more as fertilizers than as commercial products?

MR. HERTEL—The seed is not, but by gathering the seed you remove the clover, the stalk and all, and you get it into a pile and some people burn it there. I leave it on the land and let it remain there, and buy my clover seed. I figure it is of so much value per acre and it is so much work to hull it that I have never bothered gathering the seed of clover or stock peas. Stock peas have been quite high, but I would investigate the price in Illinois that was paid just at this time of the year. In St. Louis I bought seed stock peas at $1.25 and I use them in my corn field every year. The hogs will eat the stock peas and pay well, and the clover seed left in the soil will produce a valuable crop of clover which will much more than pay for the loss of the seed. On my place we do intensive farming; my crops of wheat have been over thirty bushels to the acre.

MR. HEATON—With reference to alsike and its value for pasture grass, how will it compare with red clover?

MR. HERTEL—It alone would not equal red clover, but the fact that it will remain for years and years and will never get out of the soil and the fact that I have other grass with the red top and timothy, I have an abundance of pasture. I have made ten and twelve dollars an acre in two successive years on the same tract, that is alsike, timothy and red top, for pasturing purposes.

MR. HEATON—Does the alsike store nitrate at all?

MR. HEATON—Yes, all clovers do. Instead of the red clover having one tap root, it has two or three roots. The red clover loses its surface roots after a year's growth and depends on the nourishment from the roots farther down. The alsike clover never loses the surface roots, even if it is heaved up, so that if it has been up two or three inches, these surface roots hang to the sur-

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face soil and as soon as growing weather sets in, they begin to feed again. There is no finer feed than timothy and alsike, ripening about the same time that timothy does, it makes a feed worth double what timothy alone would.

THE CHAIRMAN—If you pick the pea pods off and save the seeds in that way, that might be worth while.

MR. HERTEL—That is all right if you can get the help to do it. With stock peas, they would yield six or seven bushels to the acre and I would just plow it down, because I could not get anybody to pick them.

MR. FOSTER—I would like to ask Mr. Hertel how he harmonizes his statement that the young tree when transplanted should have the tops cut off or shortened, at the same time he says the leaves are the laboratory of the tree wherein the food is furnished. If that is so, why should we cut them off?

MR. HERTEL—Remember when the tree begins growing, it takes its whole nourishment from the material stored in the tree and until it has taken food from the soil and begins to feed upon the soil, until that time it must nourish itself from the foliage, right from the material contained in the tree and for that reason I say that if you cause too large a surface for evaporation, it will exhaust the food in the tree at a time when the tree has not firmly established itself in the soil and has not reached out its feeders all over to the soil to take in new nourishment.

MR. FOSTER—The question is whether the leaves furnish nourishment to the roots, or whether the roots furnish or supply the leaves with nourishment.

MR. HERTEL—The oxygen and carbonic acid, the roots take up all the tree food in cellular form and carry it to the leaves, where it is prepared by the chemical action of the cell in the leaf and then carried back to the tree and as I stated first, the leafy growth must first take place from the nourishment stored in the tree itself, just as all the seeds take their food and their nourishment from the kernel itself, until they have thrown out their roots and then feed on the soil.

MR. FOSTER—I take it as you give it; I so understand it, and so plant trees, but it is stoutly maintained that that is entirely wrong, that the tree should have all its leaf surface that it will produce, and therefore it will make roots faster and do better than it will to cut it off. I know that is very stoutly maintained by men that are supposed to understand it.

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MR. HERTEL—I do not think there is a closer observer than the speaker. My opportunity for seeing these things from every point during the whole year has led me to the conclusion I have formed, and I know and I maintain that it stands to reason that the tree draws its nourishment from the foliage, it cannot help itself. Sometimes those trees that have no roots feed themselves on the cellular rootlets; they take hold of the soluble matter and they feed the tree and they, themselves, must be first created from the vitality of the tree; and, as I stated before in regard to those trees, they had exhausted that moisture, they still had their life when they were restored, there was nothing but water evaporated. When that was restored, the tree was prepared to carry on its function. Another thing I forgot in my discussion was this, that I saved the moisture at one time, in an extreme case in the fall by removing a few inches of the soil, then copiously watering in the evening, then returning the soil the next morning. People when watering on the surface create what might be termed capillaries, and those evaporate the moisture that is placed there, and what might be in the soil besides, so that I would never water anything I could help on the surface. I would remove the top surface and then water.

A MEMBER—I believe Mr. Hertel's argument is true of a newly planted tree, that is pertaining to the general orchard, I coincide with Mr. Hertel on that point. I think a tree lives principally on the moisture that it contains.

MR. HERTEL—Yes, I understood that was the question; but you were speaking about newly set trees. Now, my friend, Mr. Heaton, spoke about hoeing the ground, generally I believe in that, if you can not do otherwise, but my method of saturating the soil the evening before and then replacing all of the soil the next morning, I think brings about a double result. It brings the soil into immediate contact with these little rootlets, for the very reason that it is only the minute rootlets that take the soil above. The dirt should never be exposed to extreme warmth or wind, but should be enclosed so as to protect these little feeders and the tree below must throw up these feeders before it produces any function.

MR. TATE—If Mr. Hertel's theory is right that a tree is started by itself, what is the necessity for covering the root at all?

MR. HERTEL—Placing the tree in the soil is to prevent any further evaporation. The life itself, the vitality itself, is in the tree, and when it is placed in the ground the evaporation is prevented.

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MR. STANTON—I would like to ask Mr. Hertel one or two questions in regard to his bees. I want to know if I understood him correctly, whether or not he waited until all of the bloom was off of the trees before he sprayed?

MR. HERTEL—Not all, there will be some slight bloom. I want to spray as soon as possible after the petals have fallen.

MR. STANTON—It is hardly possible that you can wait until all the bloom is off.

MR. HERTEL—Well, we did that. I cared for my bees, and I found the result from the spraying is all right.

MR. STANTON—I am trying to get at whether or not you have sprayed these trees when the bloom was open, any number of them?

MR. HERTEL—I do not think so.

MR. STANTON—You think you have waited in every case until they have all dropped.

MR. HERTEL—This last year I do not think we did, because they kept blooming for weeks and weeks.

MR. STANTON—That is the position I take; that being true, I want to ask you whether or not you saw any bad results from spraying when there were straggling blooms, on the bees?

MR. HERTEL—I failed to make any investigation until this last year, but my beekeeper, the one that has charge of my bees, told me that my bees were weaker in numbers this year than they had ever been, although the stores of honey were abundant, but there were less bees in the hives than there had been for years, and he said he could not account for that because they went into their winter quarters in very fine condition, and it is likely, I would not say possible, that quite a number lost their lives in that way.

MR. STANTON—I would like to ask you if you know whether bees gather honey from the apple blossom, or do they simply get the pollen?

MR. HERTEL—They get the honey, because I have extracted, just for an experiment, to see what amount of honey, right after the apple bloom when we had no other source of honey. I am not positive to say that there is plum, peach, cherry or apple bloom, but after the blossoming we have extracted honey just to see what amount of honey they could produce.

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MR. STANTON—Do you think from your experience and observation that this examination that you made would indicate that the bee did extract honey from the apple blossom?

MR. HERTEL—No, I cannot really state that beyond a doubt, but I know the bees this year, after the apple blossoming was over had very little new honey, the pear blossom was blighted altogether and there was very little honey in the hives, but I ascribed that to the fact that the weather was so unfavorable to the trees blooming that they did not make full use of the honey in the apple blossom, if it is produced there. I took it for granted that the honey was produced in the apple blossom.

MR. STANTON—I will state my object in asking these questions. During the last session of the legislature there was a demand for a law that prohibited spraying while the fruit tree was in bloom, and I was before this committee and made the statement that it would be impossible, because some seasons trees did not bloom all at once, and that if we sprayed within the proper time for spraying, we were bound to spray the trees while some of them were in bloom. That is to say, we could not wait until all had dropped, therefore there would be some danger about a law that would prevent every grower from spraying trees in bloom. that would prevent him from spraying at all, for there is always some bloom on the tree in most seasons. Then there was a question whether they actually got honey from the apple blossom. I had been informed that they get pollen only, that they do not get any honey from the apple blossom; they gather pollen, which is of short duration, possibly a few hours after the bloom first forms. The argument is generally that bees are poisoned by spraying, but the trees have dropped most of their bloom when we spray; in fact after they are fully opened and the pollen is off. the danger is very slight. From your close observation of matters of that kind, I was in hopes that we would get some information as to whether there was any danger in spraying trees after they had dropped all their bloom, as we would figure it, but virtually they do not drop all of their bloom, because there is always some on the trees.

MR. HALSTEAD—Any pollen-producing flower has honey as soon as it is opened. An apple blossom has been tested time and again, and it is possible to procure honey from the appple blossom just opened. If you spray the trees when the apple blossom is fully opened, you do not destroy the bees, but when the apple blossom is first opened it has honey-producing properties; any flower that has pollen will produce honey.

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MR. STANTON—How long does that take?

MR. HALSTEAD—We watched that several different times. We had bees turned loose, inside the greenhouse, to try that. You cannot test that outdoors. We tried different experiments in it, and we had apple blossoms blooming in the greenhouse to see how long the pollen would stay, and by opening the ventilators and doors, and letting the air blow through, we could see a few minutes after the flower burst open, the pollen had disappeared. But the bees are all right as long as the pollen is there, that bee is in there after the pollen. The bee, as a rule, opens the blossom, it opens the flower, it gets in, really before it opens, and that will sustain your position. There was honey there, but it would not be there after it is opened. After it is wide open, it is gone.

MR. STANTON—The position I take is, that there is very little danger in spraying at the time that the orchard is usually sprayed; that is, after the flowers have been mostly shed.

MR. HALSTEAD—That is correct. It goes off generally; there is not substance enough there to hold the bee, because the bees will drop the blossom at the time the pollen is blown away.

TUESDAY—EVENING SESSION.

THE HOME GROUNDS.

PROF. H. C. IRISH, MISSOURI BOTANICAL GARDENS, ST. LOUIS, MO.

Every family can have a garden. If there is not a foot of land, there are porches and windows. Wherever there is sunlight the plants may be made to grow and there are a few plants which will grow in shady places. And one plant in a tin can may be more inspiring and give more pleasure to one person than a large, well planted lawn would to another. Pleasure in gardening does not depend upon the area nor happily upon the cost and rarity of plants. The primary purpose of the home flower garden I think is the pleasure it gives, whether through the eye or otherwise. One person may experience a great pleasure from the simple aspect of a place without recognizing any individual plants. Another may be made happy by a love for each plant, recognizing that he is living with, and enjoying the comforts of association with his friends, while yet another may rejoice in the fact that the garden may be used for the purpose of yielding a revenue, though each

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may be a genuine object of beauty and a joy forever. How much more pleasure there is in a garden which partakes of all these features! It is not possible for many gardens to provide a place, for what one may consider the choicest of all plants. Conditions will not suit the requirements of all. I may like Japanese maples, but Japanese maples are not suited to the climate in which I live. I must learn to love the plants that I can grow. "That man is happier who has no rigid idea," as Professor Bailey says, "for gardens are coquettish, particularly with the novice. If any plants grow and thrive, and if the plants which thrive chance not be the ones which he planted, they are plants nevertheless, and we must learn to love them. We are apt to covet the things which we cannot have, but we must learn to love the plants which grow because they must. A patch of lusty pigweeds may be a better and a more worthy object than a bed of Coleus in which every spark of life and spirit and individuality has been sheared out and suppressed. The man who worries morning and night about dandelions in his lawn will find great relief in loving the dandelions. Happiness often is the quality of the person, not of the plant or the garden." I do not mean to discourage an effort to have those plants which we consider the choicest and which may be the more difficult to grow. I would rather encourage the effort, for therein lies the progress which has been made in growing of many plants, it was not possible to succeed with a few years ago. But we must not lay down any hard and fast rules, because of the varied conditions even in the same city block, to say anything of the great difference which exists between a small city block and the broader area of the suburban home. One person may attain ideal results with certain plants and certain treatment, while his neighbor just over the fence may not succeed with what seems the same care. The mysteries of nature are often beyond our comprehension. Even where other conditions are the same, the same plants will respond to a loving embrace of a friend while they may remain dumb to the most careful touch of a stranger.

An ideal painting expresses some single thought or feeling. Its expresison may be gay, retired, or quiet, as the case may be. The landscape around the home or including a broad park area should partake of these expressions. It should not be a collection of interesting objects. Mere planting and grading do not make a landscape garden. It is not enough to plant. The plants must be in the right place. The yard or lawn with bushes or flower beds scattered over is not a landscape garden. The real landscape has open breadth, space and atmosphere. It is an open space or center with mass planted sides, and vistas to the offscape. Avoid then scattered effects. Bunch or mass the planting. Preserve one or

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more open spaces. Plant the sides or boundaries with masses. Plants are more useful for the position they occupy. Walks and drives are no part of the landscape picture. They are a necessity and may be made to conform to the spirit of the picture. The place for walks is where they are needed. Make views to desirable objects in the outlaying landscape. Obstruct views of undesirable objects. Aim to have a good prospect from every window, including the kitchen.

The best results may be expected when one employs the services of a competent landscape gardener. Yet one can do much by himself and be the happier for the effort. He should come in contact with many kinds of plants, he should study them and learn their habits and characteristics. The successful practice of landscape gardening depends upon an artistic temperament and a love of nature. An intimate knowledge of plants and a familiarity with such handicrafts as grading, road making, pruning, treatment of the soil, etc., is desirable; the amateur should therefore study the subject from books and there should not be more than a partial failure the first season. With the experience thus gained he may know better, even, than the most experienced gardener, his particular needs.

The beginning of the artistic "home" lies largely in the selection of the place for that home, and in the selection of that place much depends upon personal taste. But personal taste is valuable only when under the discipline of a full knowledge of the subject to which it is applied. A dozen practical and important considerations may be lost sight of and mere love of scenery may determine the selection if taste alone is consulted. Whether one shall locate a new home in the city, in the suburbs, or in the country is a question that canont be answered without a complete understanding of all the conditions involved. Everywhere about us are building lots with more or less land for lawn and garden purposes. Those of the most limited means may find a location suited to their requirements,—rising ground, with good drainage where the surface water will quickly pass off and where there shall be an abundance of air and sunlight. For the smaller places the ground should be nearly level with a long indulating or slightly sloping surface. Such conditions being more restful than where abrupt curves abound. The boundaries count much in the future successful treatment of the place. A square area usually admits of more convenient arrangements. If oblong the narrow side should be next the road or street.

Convenience should not be overlooked. Much of the beauty of a place may be overlooked in the hardships which may be neces-

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sary to overcome in reaching a place. One might easily shut himself out from the intimate association of friends by necessitating them to visit an inconvenient place. Above all we should look for those places where we can be neighbored by a noble grove of trees where a beautiful lawn may be made for the sunset sky over a body of water and with a vista or vistas permenating to the far distance.

Before beginning the execution of planting around the home there should be a well conceived plan which should be carefully worked out along general lines in such a way that many details may be changed as the work progresses. In planning a place two general systems should be kept in mind. (1) natural, (2) formal. The former made to imitate nature in her wild and untutored stage, the latter an artificial or formal arrangement of plants in beds, in straight lines, and by the use of many walks and buildings. The former plan is the one which most concerns us, and about which most should be said. The formal, however, has its uses and its places. Walks and buildings are sometimes necessary. A straight walk may be so situated as to be more pleasing than a curved one. A row of trees may give more pleasure than a clump or mass. As I have already said buildings are necessary. They are constructed on geometrical lines. They are entirely formal and it is proper in many cases to make use of formal beds near architectural structures. It is also permissible and proper and in good taste to plant formal beds near walks. Beyond such places, however, and except for particular reasons it is best not to maintain a structural garden. Italian and French gardeners of the past preferred such gardens, but this style has had its day and is but little practiced at the present time.

Every landscape, however small, should be a picture, and if it is a picture, it must have a canvas. This canvas is the gently sloping ground. Upon it the artist paints with tree and shrub and flower, just as the painter does upon his canvas with brush and pigments. Furthermore the bare ground is the rough, unpainted canvas, the greensward is the painted foreground, which, together with the background (which is the properly arranged ornamentals) form the picture. Wihtout a proper foreground the painting would not be effective, neither would the foreground be effective without the trees, shrubs and flowers. Both are eminently important, and if one is to be emphasized more than the other, select the greensward as that essential. There may be the choicest collection of plants arranged in the most effective manner, but without the presence of the grass, there is something wrong, something lacking. Shrubs, herbs and trees lack the finish they would have if surrounded by grass.

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Convenience is an essential of outdoor art. We will never get real satisfaction if comfort or convenience have been sacrificed. Every feature of interest ought always to be easily accessible. Around many home places provision can and should be made for a vegetable garden, for a fruit garden, and even for an independent flower garden. All these should be conveniently accessible to each other and the buildings.

Seclusion and snugness serve to make a place particularly one's own. The place that has neither of these qualities might almost as well be pubic property. We often wish to romp, read, or walk or examine the various changes of nature in our garden. Something more than mere privacy is involved in the idea of snugness. It includes shelter, warmth and shade, and places for rest.

The place should have an idea of unity. There should be perfect harmony between different parts of the garden, both with respect to each other and to the house. Connection and order are the laws of universal nature. It is not wholly opposed to contrast, which may be effectually interested in small matters of detail, such as to the color of the flowers, and leaves, and the habit of plants.

Symmetry is thought of more especially in connection with geometrical or formal style, but in the most natural grouping there should be a balance, however disguised it may be. Not that the same plants should be in similar positions on opposite sides of the garden, but that the general effect shrould be, that one side as a whole is about equal to the other side in extent of plant area.

Arrangements for increasing the apparent extent of a place calls for much ingenuity. By certain arrangements of the plants, a small place may be made to appear much larger than it really is. Harmony of parts will further maintain an idea of size, for where everything is linked together to form a united whole there will be less to distract the attention and divide the interest of the beholder. The lawn may be made to appear broader by bringing the turf up close around the roots of the plants, by sinking or covering the fences and by concealing walks and buildings.

Passing to a consideration of some of the details of the subject probably more questions are asked about the making of a good lawn and getting a good turf than about the planting of trees and shrubs.

In preparing the lawn, the grade for a small place should be given a little slope and if there is too much difference in elevation, it should be modified accordingly, the amount depending upon the size of the place, and the natural slopings. If it is naturally un-

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dulating, it may be necessary only to smooth over the rough places. In any event it should slope from the sides of the residence to a greater or less distance merging gradually into a general trend. In general the grading should be done in such a way that the surface water will be evenly distributed so as not to form miniature washouts.

If the soil is poor it should be thoroughly enriched by the application of some fertilizer such as bone meal, wood ashes, or well rotted manure. The ground should be well formed before the seed is sown. The kind of seed depends upon the kind of soil. I prefer the pure Kentucky blue grass which grows well with considerable care. If the soil is sandy, red top would be recommended. The red top is said to endure drought better than the Kentucky blue grass, but it has a tendency to form bunches and does not make as neat a greensward as the Kentucky blue grass.

The season for making a lawn depends upon what the weather is going to be, for several weeks after the lawn is made. As this is impossible to predict, it is impossible to name one time as better than another. Probably success is more frequently met with by sowing the seed late in autumn at a time when it will not germinate until spring. I prefer to resow again early in the spring, so as to provide for any winter killing that may have occurred. If it is not convenient and practicable to start the lawn at this time of the year, get the ground ready as soon as you can, sow the seed as soon as the ground is in condition and repeat the sowings until there is a growth of grass.

After the seed has been sown, the ground should be given a rolling or otherwise well firmed, and if there is a season of dry weather it is wise to give water as needed.

There is much satisfaction in getting the lawns sodded. This is an expensive operation, but it gives immediate results and if it is possible to procure good sod, and if the expense is not an item sodding may be practiced. Moreover it is often necessary to sod on terraces and also desirable to sod along the edges of walks, even if the rest of the area is sown with seed.

In the selection of plants for the home grounds, published lists are often so large as to be very confusing. While for general effect the arrangement of plants is of more importance than the selection of kinds, better results can be secured by bringing together those varieties which, for example, will give a succession of bloom throughout the season, some early and others late. Again, leaf characters of some are very unlike those of others and by

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grouping those similar in character a more pleasing effect may be gained. Moreover, plants are not without beauty during the dormant season and a good selection of trees and shrubs with bright colored twigs may me made. Plants are wanted for a particular place and a few suggestions are here offered for such selections as well as others.

Hardy herbaceous plants. Other things being the same we desire those kinds which will require the least attention during the year. As a rule we look to this class for the easiest grown kinds, though there are many annuals fully as easily grown. Among the best the following may be mentioned: Columbines (*Aquilegia Caelulea and A. Chrysantha*); larkspurs (*Delphinium elatum, D. formosum, D. hybridum*); German and Japanese Iris (*Iris Germanica, I. laevigata*);Peonies; Oriental poppies (*Papaver orientalis*); blanket flower (*Gailardia grandiflora*); Lily of the Valley (*Convallaria majalis*); Cardinal flower (*Lobelia cardinalis*); Rudbeckia "Golden Glow;" hardy ferns.

Annuals. While the seed of these must be sown each year there is but little more work in connection with their growth, and many of them are more showy than the perennial kinds, especially as seen in large masses in beds. Among these I could name Cosmos; California poppy; sweet alyssum, snapdraggons; pansies; sweet peas; verbenas; Vinca rosea; V. alba; zinnias, asters, Drummond's phlox; Chinese and Japanese pinks.

Shrubs. It is perhaps most difficult to select a few from among the very large number of desirable ones and there are many more equally as good as the following: Hibiscus totus alba; fringe tree (*Chionanthus virginicus*); Deutzia, in variety; golden bell (*Forsythia viridissima*); Hydrangea paniculata grandiflora; lilacs. in variety; Spiraea Douglassi, S. Vanhoutei); mock orange (Philadelphus coronarius); Viburnums, various species, including the snowball.

Trees. These are indispensable for home planting for landscape effect. The list depends more especially on location. Many of the kinds that could be well planted in southern Illinois would not be hardy in the extreme northern part of the State. For the neighborhood of St. Louis I should include: Sweet Gum (*Liquidamber styraciflua*); Maidenhair tree (*Ginkgo biloba*); bald cypress (*Taxodium distichum*) along with some of the more commonly planted kinds as maples, elms, ash, and various evergreens.

Climbers. There are bound to be objects around the home place that should be well covered with vines, such as the glaring

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side of the dwelling or any of the outbuildings. For such purposes the following will be found useful: Dutchman's Pipe (*Aristolochia Sipho*); bittersweet (*Celastrus scandens*); Virginia creeper (*Ampelopsis quinquefolia*); Boston ivy (*Ampelopsis Vietchi*); Clematis paniculata; Wistaria.

These lists might be multiplied and lists given for plants for particular purposes, but time and space will not permit.

DISCUSSION OF PROF. IRISH'S PAPER.

MR. RIEHL—I wish to compliment Prof. Irish on his most excellent paper. I think I enjoyed it more than I ever did anything on the subject. I wish to mention a few flowers, some of those which he spoke of, which have been particularly pleasing and accommodating to me, and perhaps a few others which he might have overlooked. The hydrangea paniculata grandiflora I place at almost the head of lawn plants, especially when grown in tree form. You can place them in certain ways so that they are simply gorgeous; there is scarcely anything that will give the effect those plants will. The peonies should not be overlooked in the way of herbaceous plants. True it is that certain varieties do not cover a very great length of season, but there are so many varieties blooming at different times that it covers quite a range.

Shasta daisy is something that has given us a great deal of pleasure. They bloom from early summer until late frost continually, especially when they are properly treated. Drydoma is a plant of which some varieties are quite hardy, and they are very brilliant, quite striking; scarcely any one comes to our place that is not particularly attracted by them, they being something that is not ordinarily seen in the country. Of course the hardy lilies are nice and there is quite a long list of varieties. I think they should be represented in almost every home garden. The Althea is nice, one of the hardy shrubs which I think we can all find a place for, at least one or more plants. There is a carnation Marguerite, I think, that is about the best. It is perfectly hardy, one of the most brilliant things to look upon, and from early summer until late, it blooms right out of doors. Taking a mass of these together is a gorgeous display all summer long. Cosmos should be represented and cannas I think always. Among the climbers the honeysuckle should not be left out and one variety in particular which has given us great satisfaction and pleasure is the Belgian. It

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seems to be something new and entirely distinct, one of the nicest things we have about the place; and among climbers the clematis, of which there is a great variety, should not be overlooked.

PROF. BLAIR—I cannot help but say that I have enjoyed this paper and these remarks very greatly. I have often felt that as horticultural people we do not give as much attention in our meetings to the flowers as we should, and this discussion and this paper have been specially agreeable to me. I have enjoyed it.

HORTICULTURE AT THE UNIVERSITY OF ILLINOIS.

PROF. J. C. BLAIR, UNIVERSITY OF ILLINOIS.

PROF. BLAIR—Horticulture, as it has been developed at the University of Illinois, is recognized as one of the many big subjects which go to make up the departments, or one of the departments of a truly great State University. Horticulture there is co-ordinate in a classifactory sense, with agronomy, with animal husbandry and the other divisions of agriculture which go to make up that larger unit which we call the College of Agriculture. In the same way it may be considered co-ordinate with, or of equal rank, with the department of chemistry or geology or botany or the other divisions which are surrounded by those units which we call the departments going to make up the College of Science. Again, it is on equal footing with economics, languages and English, and those things which enter into the making up of our College of Literature and Arts. Horticulture, then, at the University, is one of five or six subjects which make up the College of Agriculture. It is these subjects or these departments in the different colleges that are considered the units of organization. In other words, in order to operate a great State University, it is necessary to have different colleges and these colleges broken up into different departments. The Department of Horticulture is different from many of the departments in the State University and certainly different from the Department of Horticulture in any other University that I know of, in one or two important particulars. But we should recognize the fact that all the subjects are not alike, that all departments are not of the same magnitude. In other words, we have at the University what might be called the one man departments. In nearly all of the State Universities horticulture might be considered as a one man department, but at the Univer-

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sity of Illinois we are unique in this particular. The department is broken up into five great divisions and each of these divisions headed by men who are specialists in those lines. Now the reason for this is briefly stated possibly in these terms.

Horticulture at any University is for the purpose of developing that subject within the State. The departments of the different colleges are for the purpose of developing those particular subjects within the State and so horticulture at the University has three aims, or three channels through which it seeks to administer to the wants of the horticulturists of Illinois—First, by giving instruction to the regular and the special students who come to the State University from all over the State; second, by the development of horticultural science by experimentation and by investigation, and third, by dissemination of information through public addresses, through public and private correspondence, through bulletins and other literature, which is sent out from the departments. Now, then, in order to fulfill its mission to the State in these various ways, you see that it is impossible for one man to straddle the entire field. They have attempted it in many states and for that reason the departments of horticulture have not thrived, because it is too broad a subject for one man to attempt to more than survey in a general way, and the man who tries it either breaks down in his work or is unable to fulfill his mission toward the State.

Horticulture, then, at the University of Illinois is divided into these three main divisions, for the purpose of investigation, for the purpose of instructing the youth who come to it, for the purpose of taking care of the correspondence and the bulletin work. Pomology is one of the divisions and that stands out by itself with a man to head that interest. Olericulture, or vegetable gardening, the growing of vegetables out of doors and indoors and from the standpoint of the amateur and the commercial man—this division also has its head. Floriculture is another division, as are also landscape gardening and forestry, and all these subjects are headed at our University by men who are specialists in the various lines. Now, then, when the student takes up his work at the University,—when the boy or girl goes there and undertakes to get some knowledge touching horticulture,—we say to him, "You cannot spend more than one-half your time in this technical subject." In other words, in order to properly develop the mind of the boy or girl, we believe that he should spend one-half of his time on what we might call the technical side, as for example, horticulture or allied subjects, and one-half in science, and in humanistic subjects, such as given in the College of Literature and Arts. A boy or a girl

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cannot spend four years in the State University devoting his or her entire time to agriculture or to horticulture. We say that, although you come to us for agriculture or for horticulture, it is our business as a department to see that you get training not only in that particular line, but that you get that training which not only enables you to be a better horticulturist, but that you get that training which will enable you to be a better citizen. When the young man or the young woman comes to the University (we have about two hundred studying horticulture at the present time —over five hundred in the College of Agriculture, the largest enrollment of any college of agriculture in the country) he or she goes first into what we call a course (Course I) designed to give them some of the fundamental principles of fruit growing. Mark you, not because one of these courses in horticulture surveys the entire field of horticulture, but because it takes up some of the fundamental principles underlying fruit growing and along with the classroom work, the student is obliged to go into the laboratory and into the field and actually do things. In other words, the development of the department has been in the direction of making a man dig deep so far as his time permits him to go rather than skip over many subjects superficially. You catch the point, I believe. Now, it may be that this (Course I) is the only course that he will take up the first year. It may be that, during the four years' course, he can crowd in along with his science and literature and arts, his humanistic studies, a number of the twenty-four courses which are offered by the Department of Horticulture. Again, we have not only divided horticulture by putting these different subjects under the supervision of the man who is especially adapted to take care of his particular subject, but these subjects, such as pomology, are again divided up until we have in the department of horticulture in the State University twenty-four distinct courses; the principal ones being those relating to fruit growing, vegetable gardening, landscape gardening, amateur floriculture, commercial floriculture, grape growing or viticulture, nut culture, and so on, until there are twenty-four for the boy who goes there.

I must not take time to run over these different courses, but I have said enough I think to show you that the University of Illinois is unique in its development of the subject of horticulture. Thirteen regularly employed people are hired yearly by the State to look after the affairs of the Department of Horticulture and in no University in the country have we horticulture better organized and better presented to the boys and girls than in Illinois.

I said that there are three channels through which the department strives to develop the horticultural interests of Illinois, and

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one was through instruction, through the work offered to the young people who go to the State University. The second was through investigation work. That is to say, we have in connection with the College of Agriculture what we term an Experiment Station, and it is the duty of the different people who have charge of these different lines of work in the Department of Horticulture to devote a portion of their time to the services of the Experiment Station. The State, then, is furthering the development of horticulture from the scientific standpoint. In other words, they take up problems and investigate them, they experiment so as to determine what are the best cultural methods, or the best way of developing the different plants which are receiving particular attention from people in the commercial world. The State has appropriated considerable sums of money to the different departments of the College, or to the Experiment Station of the College for investigational work in horticulture and other lines. A considerable amount of time has been spent and will be spent in the investigation of pomological subjects, such as the fertilizer requirements of orchards, drainage requirements of orchards, cultivation experiments, spraying experiments, pruning experiments, etc., and with vegetables, investigations touching rust of melons, fertilizers required for tomatoes and for melons and so on. It is not possible for me to go into all phases of our experimental work. Just now we have a considerable appropriation as a result of the activity of the State Florists looking toward the development of floriculture, from the scientific and practical standpoints. We hope to find out, as a result of experimentation, some of the things which need finding out along this line. In landscape gardening there is no call, especially for investigational work, but the department is giving special emphasis to the needs of the boys and girls who come to us in the way of beautifying home grounds, such as Mr. Irish spoke of this evening. We have a man who devoted thirteen years of his life to preparation for the teaching of that subject and we have instituted a special four-year course for young men who want to come to the University and become professional landscape gardeners. So it is with forestry and so it is with floriculture.

Now, I must not go further into detail. What I wanted especially to do to-night, if I had the lantern, was to show you some of the material equipment, some of the facilities which the Department of Horticulture has for the presentation of these subjects, but since it was impossible for me to get the slides ready and to get satisfactory apparatus here in time, I shall not have that opportunity.

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One other word in closing. What the Department of Horticulture is, what it does, is determined in large measure by the State organizations, such as this one. What has been accomplished at the University of Illinois is not to be credited to me and to my associates alone, although we have had some part in it, but to those friends of horticulture who have stood with us for the development of a truly live, working, forceful Department of Horticulture, and I bespeak for my associates, if not for myself and for the boys and girls who are entrusted to our care, your continued help and support, not only in speaking well of the work if you see fit to do so, but also to do what you may in putting your shoulder to the wheel which must ever grind in order to get the necessary appropriations.

PROF. IRISH—I have been particularly interested in what Prof. Blair has said in reference to the work of the horticultural department of the University of Illinois, and I think that the State of Illinois is to be congratulated upon being the pioneer in this method of organizing such a great department as they have in horticulture there, and I have but recently learned that a number of the other colleges in the country are imitating the example set by the University of Illinois in dividing up the departments in these various branches so as to give more competent help in the work that is being done.

Prof. Irish then spoke of the work of the National Council of Horticulture and asked the co-operation of the members in its work.

An invitation was extended to the Society to visit the grounds of Dr. A. S. Halstead, which invitation was accepted for tomorrow morning at 8 o'clock.

WEDNESDAY—MORNING SESSION.

THE VALUE OF CROSS POLLINATION IN THE APPLE ORCHARD.

J. W. STANTON, RICHVIEW.

MR. STANTON—My object in suggesting this was to try to learn something more about it. The value of cross pollination is a question that suggests itself only occasionally. Some seasons it is very

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apparent. This last year was one of those seasons, in orchards that are set in blocks, one would notice that next to the different varieties there were quite a good many apples and the farther one got away from these other varieties, the fewer the apples, and I think there were quite a number of orchards that showed this year the effect of cross pollination to a very marked degree. This fact some years ago became known to a few that were planting orchards and they took advantage of it in planting their trees in blocks. It has been suggested that four rows would be about the right thing, so that when you come to gathering fruit you can take four rows at a time, then there will be two rows on either side that would be pollenized by the other variety. Some have suggested that we set every other row; that would make it very inconvenient for gathering the fruit. It seems to me about four rows of varieties would be the better way to set an orchard, with that thing in view. I noticed the past season that I had one row of Ben Davis that ran through a forty-acre orchard and on either side of this one row there were early apples and late apples and there were more apples on that row than there were on any two hundred trees of Ben Davis anywhere else in the orchard, and they were pollenized apparently by the early apples as well as the late apples. I think Mr. Perrine can give us some very important information on this subject.

MR. PERRINE—We planted an orchard of forty acres, fifteen or sixteen years ago, of Ben Davis and York Imperial, and we planted them eight rows of Ben Davis to four rows of York Imperial across the orchard alternating, with the idea that if there was anything in cross pollination we would perhaps get some benefit. Well, we have been getting rather the best fruit results from that forty acres of any orchard that we have on the farm, and this year the cross pollination was more noticeable than ever before. The Ben Davis rows next to the Yorks were very perceptibly fuller than those in the center of the eight-row blocks. I think almost ten days after the bloom there was from one-third to one-half crop of Ben Davis set. They were sprayed very heavily with Bordeaux mixture and it seemed to make the apples drop. Of course you might say it was the frost that made them drop, but I think that had a great deal to do with it, and that they would have stuck better if they had not been injured with the Bordeaux mixture. Then we have another Ben Davis orchard alongside of a Benoni orchard and the side next to the Benonis has always borne the best. The orchard, as a whole, never has been very profitable until last year when it bore a profitable crop, and the orchard is twenty-five years old. Then we have a forty that we bought when the trees were about twenty years old, and one corner corners

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up to the Jonathan orchard, and since we have had the orchard that corner has always been the fullest. It is so this year and it was so last year, and it was especially so in 1905. Then, as I said yesterday, we have a little variety orchard with twelve to eighteen varieties. That orchard has apples, frost or no frost, and we do not usually get it sprayed quite as well as we do our large blocks either, but if there is any bloom there we have apples, and I believe it is mainly because of the heavy cross pollination. We have practically no bloom in the Benoni orchard I spoke of first. Of the Yorks and Ben Davis we had a very fine crop of York Imperial this year, and of the Ben Davis I think we actually harvested about two or three hundred barrels. I am satisfied we would have had a thousand barrels of Ben Davis there if they had not been injured by the Bordeaux mixture.

MR. SCHERMERHORN—In 1886 I planted an orchard of five hundred Ben Davis, five hundred and fifty Rome Beautys and four hundred and fifty Jonathan. Each variety was set in a separate block. There was a very dry season and I lost something like 180 trees of the Benonis by peach borers and I lost 183 of the Rome Beauty. I could not get any of the Rome Beauty at any of our nurseries of the kind of trees that I wanted, so I reset with Ben Davis and there has been a marked difference in that orchard right straight along, where those Ben Davis were mixed in with the Rome Beauty, and that convinced me above everything else that there was something in this cross pollination, especially in some seasons. I would not advise anybody putting out an orchard to set the varieties in blocks by themselves.

MR. PERRINE—My brother and myself at Senator Dunlap's invitation visited his orchard at Olney just at the time they were picking the Jonathan and the cross pollination in that orchard was very marked. The Ben Davis next to the Jonathan averaged a good, strong half crop. The same was true of the Aiken, and not only were the Ben Davis cross pollenized, but the other varieties as well, both Jonathan and Aiken especially, and were twice as full next to the Ben Davis as they were farther back in the orchard. They were so very full that the apples were rather small and the Jonathan were very much fuller than they were out away from the Ben Davis, so that it worked both ways. I think the Aiken is one of the strongest pollenizers for the Ben Davis that we have. The Jonathan is very fine, too, and in our large solid blocks of Ben Davis we are top-working as fast as we can with other varieties for cross pollination. We are not working very many trees, but one here and there that will give some cross pollination.

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MR. STANTON—Isn't it a fact that the Rome Beauty bloom a little bit late to be pollenized with the Ben Davis?

MR. PERRINE—A little bit, and yet the time of bloom does not seem to cut so very much figure. We have one orchard with a row of Ben Davis and a row of summer apples. We have Transparent, Red June and Benoni, Duchess and several other varieties in that Ben Davis orchard. We have always gotten very good sets of Ben Davis there when we have had the Ben Davis bloom. Most of those summer apples bloom a great deal earlier than the Ben Davis and yet we get very good results, quite a great deal of cross pollination from those early blooming summer varieties. The York Imperial blooms quite a little later than the Ben Davis and yet they cross pollenize the Ben Davis to a considerable extent, I do not think as much as if they bloomed exactly at the same time.

MR. LLOYD—What varieties are you top-working the Ben Davis with?

MR. PERRINE—We are using Jonathan. I think the Aiken is a little stronger pollenizer, but it does not bloom so young and it is a little inclined to be a shy bearer. I have been in hopes that our top-worked Aiken trees would bloom better and bear better, but I do not think they are going to do it.

MR. CASPAR—I started in a small way and planted quite a number of varieties, therefore of course mixed my small plantation up pretty thoroughly, and I have been very successful in getting fruit and have attributed this to the fact that I have my trees mixed up in different varieties, on account of cross pollination. I have had more apples this year I think than most of the growers combined in our section. I have not failed to have a profitable crop of apples for seven or eight years since my orchard came into bearing, and I attribute the fact largely to the cross pollination.

THE PRESIDENT—Will some one state how long after the bloom opens it is subject to pollination from other blossoms, that is, after the blossom is opened how long can it be affected by cross pollination, or any other way?

MR. STANTON—I think the Doctor over there gave us some information yesterday on that point as to how long after the bloom opened the pollen disappears.

DR. HALSTEAD—The pollen disappears very suddenly after the bloom opens. The apple blossom throws the bloom open very wide, in doing this it absorbs the pollen, and if it is a clear day the bees are after what little bit is left of it and it is only after it is open a

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short time, it may be a few minutes; we tried that, in taking a branch of apple tree into the greenhouse and putting into a temperature of about eighty, we found it was only a few minutes that it remained on there, and the only way to find that out was to watch it with a microscope of about 250 diameters to see when they moved about. The little point that holds the pollen up is so frail that as soon as the wind strikes it, it drives it away. You can only ascertain that by going into the tree. I have gotten up into a tree and taken my magnifying glass to watch it better, to see what it will do, but it is only a few minutes, a little draft of wind drives it away suddenly, especially after the bloom opens up wide. If the bloom remains cup-shaped, it remains a little longer. On a nice warm day a bee will jump in and it will burst open very quickly. I have been getting up among the branches, sitting up there for hours. Unless you have a magnifying glass of 250 diameters you cannot see the pollen move, and I should say within one-half hour after the time they open wide the pollen is gone.

MR. JINNETTE—The question the chairman asked was, how long after the bloom opens will pollen be effective coming from another blossom?

DR. HALSTEAD—We will figure that from the pollenizing of other plants or flowers. We will take a carnation, for instance, and we can regulate that fertilizing from one to another by what this one does. Take the pollen from one into another, and if the pollen is effective in the carnation, within twelve hours from that time the carnation will close up and go to sleep. It is the same with the apple blossom. I consider that within eight or ten hours, from the time that that flower opened, if pollen from another is driven over by the moving of the air, it will drop in there and pollenize it, within ten or twelve hours after.

MR. JINNETTE—Do you mean that within ten or twelve hours after the apple blossom opened it would, and then after that time it would not be susceptible?

DR. HALSTEAD—That depends on the weather. If we have nice dry weather, they are more susceptible than in weather where there is moisture. If we have heavy rains, it does not travel.

MR. JINNETTE—Do you mean to say that when it has been fertilized, it then closes up; is that the idea?

DR. HALSTEAD—Not an apple blossom, no; the stamen and pistil are like my hand, this way, the pollen is way down, little bits of points in the center; sometimes they go through and if they are caught inside of there they cannot get away and then they fertilize

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themselves the same as the tomato plant does, by the air outside, but when they are taken from one to the other, where I want to distribute from this tree to that tree, why, the thing to do will be to take it over there and it will pollenize in ten hours.

MR. PERRINE—You think the wind is quite an agent in cross pollination?

DR. HALSTEAD—Oh, yes, it is, there is no doubt about that. Take, for instance, a tómato plant; out in the open air the pollen is brought back into the flower by the wind stirring the plant, making the pollen go back and fruit. It is a study that has not been perfected yet, the pollination of flowers and plants.

MR. PERRINE—You think bees are not absolutely necessary for cross pollination?

DR. HALSTEAD—No, sir, I do not think they are necessary at all, because if we have a dry day and if there is a good air stirring, that does the work.

CARE OF THE APPLE ORCHARD IN OFF YEARS.

W. S. PERRINE, CENTRALIA.

Most orchardists are very familiar with these off years. The fact is, with the average orchard, more years are off than on. Consequently to the most of us this ought to be a very important subject.

The yield of a corn or potato crop will be cut short if the cultivation and care are neglected at any time during the growing period. Just so the yield of the orchard will be reduced if the orchard is neglected one or more years. The crop from the orchard is really the aggregate yield during its entire life.

It is folly to stay out of the orchard simply because it promises to yield little or no fruit the present season. The care given the orchard one season affects the orchard not only that season, but for the next and probably during the whole life. Neglect for one season or more will have its effect in the same way.

They tell us that it takes at least two seasons to complete the development of a fruit bud. Therefore to produce next year's fruit crop it is necesary that we should have cultivated and cared for the orchard during the present season, and probably last season as well. We want fruit buds that will not only blossom, but we

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want strong buds with vitality enough to set fruit, if possible, in spite of adverse conditions; for if we can get fruit the off year, that is when it will bring us the most money.

I do not mean to advocate that the spraying and cultivation should be as extensive and long continued, in the off year, as if we had a heavy crop. Then, too, a young orchard of bearing age that is growing too fast, may be and probably should be neglected a little to bring into bearing by checking the growth.

Growers are apt to become discouraged too quickly and think they have no apples when they have enough to be very profitable if thoroughly sprayed. This year we gave our Ben Davis all the early sprays and they were as thorough as if a heavy crop were in prospect. The result was that we had Ben Davis—more than enough to pay our entire spraying bill and also that of harvesting all the varieties. Then, besides, we believe that this thorough spraying will help a good deal toward a good crop next year and the year after.

I advocate thorough spraying, and yet it can be overdone, when using Bordeaux mixture. This is especially true if the weather is wet and bad, as it was this year.

This year a great deal of injury to apple foliage was caused by heavy application of Bordeaux. This was true even of weak Bordeaux. But this was a remarkable season—probably the worst in fifty years or more.

Then I believe it will pay to care for the orchard year after year, regardless of whether we have apples or not, for in due season we shall reap if we faint not.

Discussion of Mr. Perrine's Paper.

Mr. Stanton—I do not think we ought to get the impression now that it will do to leave off the Bordeaux mixture. This was an unusual season, and as Mr. Perrine has said, we may not have another like it for years, and as Prof. Crandall has said, the scab did not develop this year anyhow, so that the importance of the Bordeaux spray ought not to be overlooked. You cannot take one season as a guide. The fact remains that in this orchard of Mr. Perrine, where he had used the weak Bordeaux, I rode through the orchard this fall before the Ben Davis were picked, and while there were only a few specimens on some trees, they were perfect apples and we know that in seasons when there are only a few apples they are apt not to be very perfect. The only criticism I have to make

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of the paper is, it is liable to give the impression that you can leave off the Bordeaux mixture on account of the injuries that have been done this year, but the weather was such that you could hardly do any spraying and it was so wet that it washed the lime out and of course produced the injury which he has noted, but in ordinary seasons it does not seem to me that that would be the case from our experience heretofore. But I think it has been proven pretty conclusively that we do not need to use as much copper sulphate as we have used; I think it is pretty well settled that we are using more than is actually necessary in the 4-4 formula.

MR. PERRINE—I think Mr. Stanton's remarks are very timely. We want to be very careful about going to extremes. If we have been using too much blue stone, we want to be very careful about using too little; we may run up against it some years if we do not use enough blue stone, we may sustain a great deal of loss by not having used enough. I think it is not quite true, however, that we did not have scab. We did have scab; that was shown in the unsprayed orchards from the fact that the foliage dropped early, about as early as usual. Of course it may have been due to other fungous troubles, but I think it is largely due to apple scab. This orchard that you spoke of that we bought, the contract was made about ten days after the bloom; on the Jonathan there was no perceptible apple scab fungus, but on the Ben Davis there was lots of apple scab fungus on low ground and on the day we commenced spraying there were lots of leaves that had fifteen to twenty spots of apple scab on. They were not all that way, there were not very many comparatively, but then you could see them here and there.

MR. STANTON—How had that orchard been sprayed before?

MR. PERRINE—It had been sprayed off and on for years, but never had received thorough spraying.

THE PRESIDENT—Give us your formula that you have got now, after having tried the different strengths that you used from year to year, what do you use now?

MR. PERRINE—In our large orchards, this year, spraying at large, we used the Bordeaux that had a little over one pound to fifty gallons of water. We used it on the Ben Davis three times and I believe it would have paid even with our sprinkling of a crop, I think it would have paid if we had sprayed them later on once more. These applications were all made on our orchard about ten days after the blooming, and it was a little bit too early. I think we would have had a little better results on our Ben Davis if the sprays had been strung out a little bit more, it was just a lit-

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tle bit too often to get the very best results up to picking time. On our Grimes and Jonathan and York Imperial we sprayed later, sprayed about the first of August.

MR. STANTON—If you were going to spray only three times, once before and twice afterwards, what strength would you use?

MR. PERRINE—Well, I do not like to say for fear of misleading other people. I do not believe that we will have to use after the bloom Bordeaux stronger than one pound. Before the bloom, not stronger than two pounds. Our experiments and our experience have proved to us that the weaker Bordeaux does practically as well; we get practically as good results from it as far as freedom from scab is concerned, and we get a whole lot less injury. We have had at our place a great deal of spray injury when other people did not seem to have much. I think it is partly due to a weakened condition of our orchard due to over-pruning, making them very susceptible to Bordeaux injury and this injury seemed to be cumulative, that is, the longer we sprayed the more easily they were injured and consequently we were driven, just simply driven, to do away with this spray injury some way and we did not know of any other way than to reduce the strength of the Bordeaux. This year we got considerable injury with one pound Bordeaux, although not nearly so much as we did with four pounds.

MR. SCHERMERHORN—I would like to ask Mr. Perrine whether he used the same number of pounds of lime with the reduced amount of copper sulphate?

MR. PERRINE—Yes. In our spraying where we used the poison alone, we used the lime with that. I do not like to use the spray, it makes a very heavy spray, it goes right down in the spray tank, you have got to have very good agitation or your spray settles, but we like to use the lime especially where we have some Paris green with the arsenate of lead, it gives us good results.

MR. STANTON—I woud like to ask Prof. Crandall in regard to the cloud on apples, the sooty mixture of fungus that gets on the trees and washes off on the leaves and onto the apple in some seasons, I would like to know whether he knows anything about that fungus or what it is.

PROF. CRANDALL—The life histories of those fungi have not been worked out, but I think they can be controlled. We have not said very much about the use of summer spray, but I believe that we have got to use more spray during the summer for the control of insect work that comes late in the season. The skeletonizer works on the foliage and on the apple and there are more little in-

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sects that work on the apple that injure the fruit very much and I believe it is important that we use some kind of insecticide some time during the summer or late in June.

MR. JINNETTE—What are you going to use for the aphis?

PROF. CRANDALL—I do not know, unless we use the kerosene emulsion. They are not difficult to get at. I do not know of any remedy that would be better than kerosene emulsion for those, the arsenates do not do any good unless it be simply the mechanical action of the spray knocking them off.

MR. PERRINE—I think Prof. Crandall raises a very valuable point when he says we ought to do late spraying. This year is the first year we have done this late spraying and on sixty acres of apples we gave two sprays early, about ten days after the bloom, and then two late sprays, I think about the first of August, and I do not believe we ever got such apples before. The buyer was there and looked after the packing and those Jonathan ran fifteen barrels of No. 1 to one barrel of No. 2 in the best part of the orchard. We had, I think, a greater effect on the Grimes, if possible, than on the Jonathan. The Grimes is very subject to late injury, but this year with our late sprays they were very fine. We use the arsenate of lead alone for late sprays.

MR. ECKERT—I would like to ask Mr. Perrine or Mr. Stanton if they have not found at times considerable variations in the different brands of arsenate of lead? Two years ago the manager at Grand Junction, Colorado, said they had a great deal of trouble on this account, did not get the quality of arsenate of lead that they had bargained for, and of course it fell down. In regard to late spraying, I see in Canon City, Colorado, everybody practices late spraying, two applications, and their apples certainly run very clean, but they say an invariable rule there is to spray in August.

MR. PERRINE—In 1901 we tried the home made lead, and we liked it; the next year we tried a lead paste that we got of Levenberg in New York, supposed to be one of the best manufacturers in the country, but that was not satisfactory, it gave us injury. We used it entirely with Bordeaux mixture, but Dr. Forbes carried on some experiments at our place using that Levenberg lead alone, and it scorched the foliage like everything, showing that our injury that we laid to the Bordeaux mixture was partly due to the paste lead. Since then we have made our own lead, but when you make your own lead, you run the same risk of getting arsenite of soda, if you do not know what the composition is; of course you can get

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them to say what it is, but the question is whether it is that or not, But I think Disparine and Swift's paste lead are pretty reliable and some of the other good brands.

MR. ECKERT—In regard to that, I will say that it was Swift's brand that fell down in Colorado and I have always heard Disparine better spoken of. We have used it, but there are some Eastern parties now with the Target brand, and they say they will give a guaranty against scorching, furthermore they say they will give a guaranty on their goods in accordance with the quality of arsenate of lead subject to examination by any chemist. If that is the case, it seems to me they must have a pretty good product if they can stand by that.

MR. PERRINE—I had a letter recently from the Disparine people; they guarantee twelve per cent arsenious acid, the Target people make it fifteen per cent. In that case it is a better and cheaper lead, when you come to figure out what you are paying for arsenious acid, and you are paying more than twice as much for it in buying the paste lead as if you made it yourself. If you are spraying on a large enough scale to pay to do it, it will pay to make your own lead. Of course using a small amount, it is better to buy it. If you can buy it in original packages, buying the ingredients, acetate of lead and arsenate of soda in original packages, you can get it pretty cheap, around eight cents, at least last year, and I think that is about the price this year, eight cents a pound, and the arsenite of soda is about the same. The arsenate of soda that we have gotten always comes in five or six hundred pound barrels. In all these chemicals, the smaller the package the higher the price.

PREMIUMS AWARDED.

CLASS I—APPLES.

EDWIN H. RIEHL, JUDGE.

Best display of apples, not less than 12 varieties—First, H. C. Eckert & Son.

Best plate Yellow Transparent—First, L. L. Caspar.

Best plate Benoni—First, L. L. Caspar.

Best plate Ben Davis—First, H. L. Biebel; second, Alexis Mottaz.

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Best plate Willow Twig—First, Alex. Mottaz.

Best plate Rome Beauty—First, Chas. Hertel; second, Alexis Mottaz.

Best plate Jonathan—First W. S. Perrine; second, H. C. Eckert & Sons.

Best plate Grimes Golden—First, W. S. Perrine.

Best plate Wine Sap—First, H. L. Biebel; second, H. C. Eckert & Sons.

Best plate Romanite—First, H. L. Biebel.

Best plate Janet—First, H. C. Eckert & Sons; second, Alex. Mottaz.

Best plate Winter May—First, L. L. Caspar.

Best plate York Imperial—First, H. C. Eckert & Son.

Best plate Black Twig—First, H. L. Biebel; second, Alex. Mottaz.

Best plate Aikin—First, C. E. Eckert & Sons.

ELECTION OF OFFICERS.

Election of officers being next in order, the following officers were unanimously elected: President, A. V. Schermerhorn, Kinmundy; 1st Vice-President, J. C. B. Heaton, New Burnside; 2d Vice-President, A. S. Halstead, Belleville; 3d Vice-President, G. W. Endicott, Villa Ridge; Secretary-Treasurer, E. G. Mendenhall. Kinmundy. Mount Vernon was selected as the next place of meeting.

STRAWBERRY GROWING FOR PLEASURE.

EDWIN H. RIEHL, NORTH ALTON.

There are comparatively few who can afford to grow strawberries just for the pleasure there is in it, while ordinarily to grow for pleasure means more or less profit, and to grow for profit is sure to give pleasure if the work is thorough. There are a few

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exceptions when nothing but pleasure is likely to result with a very slight chance of profit.

I will first refer to growing strawberries from seed, in which I have had a great deal of experience. In the earlier days when I was quite a small boy my father was growing strawberries for market and it was always his hobby to test all the new varieties as they were offered, which were very few in those days compared with now.

Although all of the different fruits were grown for market at my home in those days, the strawberry was my favorite, and the different varieties were as familiar to me as were the faces of my best friends. Without any knowledge of how new varieties originated, I was one day surprised to find in an old quince orchard not in cultivation at the time, a few strawberry plants in different places bearing some of the finest berries I had ever seen, and different from others with which I was acquainted. Upon calling my father's attention to them he explained to me that these plants came up from seed where the old patch was plowed up two years previous, and said that in this way we got new varieties. So much interested was I that every one of those plants in that orchard, consisting of several hundred, were carefully taken up and planted in a little patch of new ground, which the previous year I had cleared for my own garden. The plants grew nicely and not a weed being permitted to grow, they were the next year in a fine fruiting condition. If ever there was a happy boy it was I the next year when fruit began to ripen. Every morning bright and early I would run to father with new berries and ask his opinion about them. It was indeed a fine study for me. Some of them did not bear at all the first year. Some never bore at all, some late, some very large and fine, but bore too few berries to be of value; some seemed desirable in every way, but were so poor in quality that they were promptly discarded.

Most of them were too small to warrant further trial after the second year's fruiting. Some were so nice that we thought several would prove better than any we had yet fruited, and were planted on a fairly large scale. Only one of the entire lot proved to be worthy of introduction, which, some years later, after it had been fruited on a large commercial scale, was named Ruby, and offered to the public. This, at the time of its introduction, was considered by the best authorities to be the best variety ever offered.

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Later on it was found that it was a little peculiar in its habits, in that it would succeed admirably in some places and not be a success in other sections. It is, however, still largely grown by a good many growers who consider it the best on the market.

My second attempt at growing seedlings was from seed of Minor's Prolific, which at the time was the leading new variety. Several thousand of these seedlings were grown and fruited, and not one was equal to the parent, so were promptly destroyed. Several hundred Ruby seedlings were then grown and only one of this lot was good enough to warrant several years' trial, and was discarded last season because of better varieties having been introduced in the meantime.

The next attempt was from Brandywine seed, pollenized by Ruby, and from this lot I got more good berries than from all the rest put together. One of these, No. 28, is particularly good, combining more good points than that of any other early variety. This I have grown the past ten years for market and have never offered any plants for sale.

The last lot of seedlings with Dunlap for parent gave me two very good ones—Early Bird, very early, and Wren, medium to very late. Both very promising.

There is certainly no wealth to be accumulated by one who grows strawberries in this way, and the man who undertakes to do such work should be one who has made a fortune in the strawberry business and can afford to retire and take up such work simply for the pleasure he finds in it, and the glory, in case he finds something superior to give the public.

Another branch of strawberry raising which is more interesting than profitable is that of testing new varieties. For several years past I have had charge of an experiment station where all varieties of seeming merit are being tested, and during the fruiting season I find great pleasure in going up and down the rows studying the different varieties and taking notes.

In testing from twenty-five to fifty new varieties each season I find that less than one-half on an average are worth more than a second season's trial.

Nearly all who grow strawberries know that comparatively few varieties succeed well over a wide range of country and in testing varieties we must bear this fact in mind and not be hasty in condemning varieties which, with the one doing the testing, does not compare favorably with others. Yet we all know that entirely too many varieties are being offered.

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No variety should be offered until it has been thoroughly tested by the originator and introduced and found to be considerably better than the average variety on the market.

Too many varieties have been sent out simply for what could be made out of the plants at the high price offered the first year or two, before the purchaser has a chance to discover that the variety has no merit.

Growing strawberries for exhibition purposes is also pleasant work, and quite frequently profitable, too. True it is that to be successful in growing strawberries nowadays we must do away with the thickly matted row, which not many years ago was the only method used. In recent years all of the most successful growers use either the hedge row or the hill method. In this way with proper culture and plenty of plant food, the fruit is all large and plenty of it, too; but when the very largest berries are desired we must go still further.

The largest and most handsome berries are produced by selecting varieties that are naturally very large. A strong, healthy plant of such a variety is found and the best runners potted in July or August. Early in the fall these potted plants are set in the best soil on the premises, prepared in the very best manner. Shallow cultivation should be kept up so as to have a dust mulch around the plants at all times. Plants should be eighteen inches apart both ways and all runners kept off. Late in the fall good, rich manure should be placed around and between the plants and just enough over them to keep from smothering them. In the spring the manure is worked over and the soil beneath it stirred and fresh manure added. All the blossom buds but a few are cut off as soon as they appear. In this way berries have been grown three inches in diameter; and without removing any buds it is possible to get a good yield of berries that will run from ten to twenty berries to the quart.

I have heard it said that there was such a thing as getting soil too rich for strawberries, especially for some varieties; and that was true in reference to the old method of growing in the wide matted row, but grow them in the hedge row or hill, keeping all runners off and there is no such thing as getting the soil too rich for any variety.

You have heard the expression, "the most pleasant way to raise strawberries is to raise them with a spoon," but this is no reflection on the possible pleasures of growing and studying this most interesting and accommodating plant. "Doubtless God

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might have made a better berry, but doubtless God never did." is a very popular expression nowadays because of its truthfulness.

Just as the apple stands king of orchard fruits, the strawberry is by far the most valuable and pleasing of all berries.

A motion by Mr. Schermerhorn that a committee on Necrology be appointed was carried, and the President appointed as that committee Messrs. Lloyd, Perrine and Jolly.

WEDNESDAY—AFTERNOON SESSION.

MELON RUST INVESTIGATIONS.

JOHN W. LLOYD, UNIVERSITY OF ILLINOIS.

For the past three years the Illinois Agricultural Experiment Station has been giving considerable attention to the disease of muskmelons commonly known as the rust. This disease appears as small circular brown spots upon the leaves about the time the vines set their fruit. The spots gradually increase in size and number, until finally they run together, and the entire leaf becomes brown and dead. A period of from three to four weeks may elapse from the time the first rust spot appears upon a leaf until that particular leaf is dead. The oldest leaves, at the center of the hill, are the first to be attacked, and the infection gradually spreads outward until all the foliage is involved. The young growing tips are the last to be infected, and may remain green until after the rest of the foliage is dead. Not only does the rust spread from a point of early infection to other foliage on the same hill, but an early infected hill serves as a center from which surrounding hills soon become infected. Thus it frequently occurs that badly rusted areas, consisting of several hills each, appear at various points in a field before the plantation as a whole seems to be seriously affected. However, when this stage is reached, every hill in the plantation is usually infected, and it is merely a matter of time until all the foliage will collapse.

The collapse of the foliage over the entire plantation often seems quite sudden, and many people do not realize the presence of the rust until this occurs, even though the disease may have been

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visible to a careful observer for five or six weeks. Many leaves at the centers of early infected hills have usually died before this time, but the field as a whole continues to look green until there is a general collapse of a large part of the foliage. This occurs when the brown spots run together, and seems more sudden than it really is. The final collapse may be hastened by a heavy rain, so that the rain is often ascribed as the cause of the rust. As a matter of fact, the moist conditions merely favor the more rapid development of the disease already present.

If the leaves die before the melons ripen, the fruits do not develop normally, but ripen prematurely without properly netting, and are deficient in size and flavor. Many of the later fruits fail utterly, so that the quantity as well as quality of the product is often greatly reduced. Usually the leaves do not die until after the earliest melons have ripened, and these are of fine quality. The later melons, which mature after the vines have begun to fail, are decidedly lacking in flavor; so that there is no uniformity in the quality of the product throughout the shipping season. Whenever the rust is at all prevalent, most of the melons ripen after the vines are in poor condition and the crop as a whole averages of very poor quality.

For the past few years the rust has been very prevalent throughout the melon producing regions of the state, and for at least four years it has been impossible to find a single melon patch in Southern Illinois in which the rust was not present. It is true that in some years it is more destructive than in others, and that in some patches the main crop matures before the leaves collapse, but in general the rust has had a decided influence upon the quality of Illinois melons, and has been largely responsible for bringing about the conditions resulting in their present deplorable reputation upon the markets.

In seeking means for avoiding injury from this disease, the matter of rotation naturally suggested itself. Inquiry among growers and observation of their plantations show that as a rule the rust is worse in patches on ground which has produced melons the preceding year or for several successive years, than in patches located where melons have not recently been grown. However, the disease cannot be entirely avoided by rotation, for it is sure to appear in every patch in a melon growing region no matter how far the field is located from areas which have previously produced melons.

The previous treatment of the land seems to have some influence upon the susceptibility of the melons to rust. For example,

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patches planted on clover sod usually do not suffer so badly from rust as most patches in the same locality. It has also been observed that melon vines growing on the site of an old rhubarb plantation, which has received heavy annual applications of manure through a series of years, usually remain green and vigorous long after the vines in neighboring patches have succumbed to the rust. Striking examples of this have been observed where part of the melon plantation was on old rhubarb land and the rest on the same kind of soil immediately adjoining. The same thing has been observed where a melon plantation has included land that has been repeatedly manured for the production of winter onions. To a less marked degree, one heavy application of manure broadcast preceding the planting of the melons has seemed to enable the vines to withstand the rust better than those on similar land not so treated. The lower portions of a plantation, which have received the wash from higher areas, and are consequently richer, often produce vines which withstand the rust until after those on the higher points have succumbed. This indicates that a soil rich in humus and nitrogen is capable of producing a vine which by reason of its greater vigor is able longer to withstand an attack of the rust. In certain cases vines on such land have been known to mature their entire crop, and to be green and producing new leaves and blossoms when the last of the crop was shipped, while on adjoining areas, less fully supplied with food materials resulting from previous heavy manuring, the vines were dead when the last melons were picked.

Although the selection of a proper site in reference to its previous treatment and cropping has some influence upon the extent to which a melon plantation will be injured by the rust, this alone cannot be relied upon to control the rust to such an extent as to insure the full and normal development of the melons. In view of this fact, repeated tests have been made to determine the efficiency of spraying for the control of the melon rust. Various mixtures have been used, but the one which has proven most satisfactory is a dilute Bordeaux mixture, consisting of two pounds of copper sulphate and four pounds of lime to each fifty gallons of water. Various numbers of applications from three to nine have been tried, and the results indicate that the latter number is much more effective than the former. Spraying should begin soon after the vines have set their earliest fruits, and should be repeated at sufficiently frequent intervals to keep the foliage well covered with the Bordeaux mixture. It will usually be necessary to make at least one application per week, and in case of heavy rains, more frequent applications may be needed. This treatment should be continued at least until the shipping season begins, and if possible, until near its close. Such treatment will not prevent the appearance of the

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THREE-BOW SPRAYER IN OPERATION.

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rust, and in many cases will not prevent even the ultimate destruction of the foliage, but it prevents the rapid development of the disease and enables the foliage to remain green and perform its functions for a longer time than would otherwise be the case. This makes the melons of better flavor and develops a larger proportion of the crop into a salable product.

The early spraying can best be done by use of a three-row sprayer mounted on a cart or light wagon drawn by two horses. It will be necessary to train the vines lengthwise of the row in order to avoid injury from the horses and cart. This will usually involve the turning of the vines before each application.

This turning of the vines may seem rather expensive, but it has other advantages in addition to facilitating the spraying. It makes late tillage possible, and thus promotes the better development of the crop. It also greatly facilitates the harvesting of the melons, and enables the pickers to work rapidly without tramping the vines.

For the later spraying, especially the applications made after shipping has begun, it may seem preferable to avoid driving through the patch as much as possible, and to direct the spray more accurately than might be possible with a row sprayer, to avoid staining the fruits with the spraying material. In that case, only a few rows of vines are turned, so as to make a driveway through the patch every sixty feet, and by use of a long hose and extension rod, a strip thirty feet wide is sprayed on each side of each driveway. Three men are necessary to operate the spraying outfit when this method is employed, since one is needed to carry the hose and keep it from dragging on the vines.

The actual cost of spraying melons will vary according to local conditions, the kind of machinery used, and the price of labor and material in the particular locality, but a specific example may be mentioned by way of illustration. In 1907 a certain six-acre field of melons was sprayed five times with a three-row sprayer before the picking season began, and twice afterwards by the use of a long hose. The cost of making the first five applications, including the turning of the vines, was as follows:

Turning vines, 100 hours at 10c	$10 00
Spraying with team and two men, 24½ hours at 37½c	9 19
Cost of material, 14 bbls. at 20c	2 80
Total	$21 99

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The cost of the two applications made after picking had begun was as follows:

Turning vines, 11 hours at 10c	$ 1 10
Spraying with team and three men, 16 hours at 50c	8 00
Cost of material, 8 bbls. at 20c	1 60
Total	$10 70

The total cost of making the seven applications to the six acres was, therefore, $32.69, or $5.45 per acre. If two more applications had been made, the cost would have been increased to approximately $7.23 per acre.

While spraying has in some of the tests proved extremely beneficial, it has not always given as marked results as might be desired, and adds materially to the cost of growing the crop. It will, therefore, be welcome news to many that there is another possible solution to the melon rust problem in Illinois. It lies in the direction of growing rust-resistant strains of the gem melon, developed by careful selection of the most resistant plants through a series of years.

Such a strain has already been produced in Colorado; and through the courtesy of Mr. P. K. Blinn, of Rocky Ford, the Illinois Experiment Station was able to secure some of the seed last spring. This was divided into half-ounce packets and distributed among a number of growers located at three of the principal melon producing points in the State.

Owing to unfavorable conditions, many of those to whom seed was sent failed to secure a stand, but in every case where a crop was grown, the results were practically identical, viz.: the vines of the rust-resistant strain remained green and vigorous after the ordinary varieties had died from the effects of the rust, and by reason of this healthy condition of the vines, the fruits of the rust-resistant strain were exceedingly well netted and of exceptionally fine flavor. The only objection raised against this strain is its rather late maturity; but with proper selection with this point in view, an earlier strain could doubtless be developed.

While all the vines of the rust-resistant strain of melons withstood the rust much better than other varieties, there were marked differences in the behavior of individual vines. Some plants succumbed before maturing their entire crop, while others, grown under the same conditions, remained in full vigor for a much longer time, and were still green when the latest melons ripened.

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Seed has been saved from the most promising vines, with a view to making further selections in the hope of eventually establishing a strain of melons that will uniformly resist the rust under Illinois conditions.

By way of summary it may be said that the results so far obtained in the melon rust investigations by the Illinois Agricultural Experiment Station indicate that while serious injury from the rust may sometimes be avoided by careful selection of the site for the plantation, better results can usually be obtained if in addition the vines are sprayed repeatedly with dilute Bordeaux mixture; and further, that the necessity of spraying may eventually be obviated by the introduction of rust-resistant strains of the gem melon.

FINAL RESOLUTIONS.

The following report of the committee on final resolutions was read and adopted:

Your committee on resolutions beg leave to submit the following report:

Resolved, That the thanks of this Society be extended to L. F. Dintlemann and W. E. Eckert for their efforts to make this meeting a success; to Dr. A. S. Halstead for courtesies extended to the Society; to those who have read papers and taken part in the discussions, and to all others who have in any way contributed to the success of the meeting.

E. R. JINNETTE,
A. V. SCHERMERHORN,
L. L. CASPAR,
Committee

CUCUMBERS.

H. M. PLOTT, BALCOM, ILL.

STARTING THE PLANTS.

The earlier cucumbers can be marketed the greater the profit to the grower. In fact, there is seldom any profit in late ones at Balcom. To get them early the plants must be started in hot houses or hot beds. Nearly all Balcom growers use hot beds heated with

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fire. They are usually five feet nine inches wide, and they can be made any length up to 200 feet. But a bed seventy-five or eighty feet long will prove more satisfactory than one of greater length, because it can be heated more uniformly and with less fuel.

It is important to have the hot bed on a sheltered spot with a sunny exposure, and there should be slope enough to insure a good draught in the flues. The furnace, or fire box, must be at the lower end, and outside of the bed. Two flues are necessary to heat the bed. They should be five inches from the sides, and extend from the furnace to the upper end of the bed where they terminate in chimneys six or eight feet high The flues are simply trenches with sloping sides, ten or twelve inches wide, and six or eight inches deep, and covered with flat stones. The dirt over the flues should be thirty-six inches deep at the furnace, and taper down to about eight inches at the upper end, in a bed eighty feet long. Some time before the bed is to be used it should be covered with two or three inches of well rotted manure, and this should be worked in, and the surface thoroughly fined just before the seeds are planted.

The seeds are planted in dirt bands about the first of April. These dirt bands are bottomless boxes made of thin strips of veneering four inches square and three inches deep. They are placed snugly in the bed without tacking, and filled with good loamy soil from the woods. The soil in the boxes is firmed down before the seeds are put in. If the seeds are good, three in a box are a plenty. The soil should be screened for covering the seed, and care should be taken not to cover them too deep It is important to have the bed well warmed up before the planting is done. If conditions are favorable the plants will be up in three or four days.

SELECTION OF SOIL.

Success in growing cucumbers depends much upon the selection of the soil. They must have a loose, loamy soil with an abundance of humus in it. It is useless to plant them on a compact clay soil. The ideal cucumber land is a sheltered valley protected from the northwest winds, and having a southeast exposure. From such land heavily manured and properly prepared and cultivated a prodigious yield of early cucumbers can be obtained.

PREPARATION OF THE SOIL.

The land should be plowed in the fall and a heavy coat of manure worked in with a disc. Thirty tons to the acre are about

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right. Plow the land again in the spring as soon as the ground is dry enough, and harrow thoroughly. Mark off the rows four feet apart each way, and put a forkfull of well rotted manure in each hill, and cover it with two furrows with a one-horse turning plow. If the seeds were planted from the first to the tenth of April the plants will be ready to go to the field about the first of May. The hills are then opened up, the manure well mixed with the soil, and the plants put in. If the plants are properly wetted down in the bed, and carefully handled and properly set out, they will hardly stop growing.

CULTIVATION.

Start the cultivator as soon as the plants are all in the field, and keep it going till the vines interfere. Cultivate deep and close to the plants until they start to run. After that keep away and run the cultivator shallow so as not to mutilate the roots.

When we first began growing cucumbers at Balcom 600 climax baskets per acre was considered a good yield. Now with the right soil and location we get from 2,500 to 3,000 baskets to the acre.

Here are some figures which show the results obtained from cucumbers by some Balcom growers: F. T. Davis has between two and three acres that have netted him over $5,000 in the last five years after deducting manure and box bills. Calvin Gurley has a plat containing three-fourths of an acre that has made a record of 2,500 baskets in one year which netted $500. But the most astonishing results were obtained by H. S. Noble this year. On a plat 72x120 feet, containing a little less than one-fifth of an acre, he grew 600 baskets that sold for a little over $200. After deducting manure and box bills he had $158 left. The above figures are not mere guess work, but were taken from the sales returned by the commission men.

In conclusion it seems to me that the homely "Cuke" will compare favorably with the famous "red apple" as a money maker.

DISCUSSION.

MR. SCHERMERHORN—I want to say a word about melon rust. I have been in the business something like twenty years and was simply put out of business by the rust, the last two or three times I raised a crop, the rust got them and I am wonderfully encouraged by hearing of this new rust resisting variety. It seems to me that there must be considerable in it. I have never thought it would be practical to control rust by spraying on a commercial scale that would hardly pay.

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MR. RIEHL—I know from personal experience that there is such a thing as subduing the rust in a way by the selection of certain varieties. This year we tested quite a number of new ones, some of them were entirely free, while others right alongside went all to pieces. There was one called the Gold Mine that was entirely free from rust, as was also the Admiral Dago. We had this year I should say the finest musk melons we have ever had. They began to ripen early in the summer and we had them right up until after frost.

MR. ECKERT—I am sorry I missed most of the paper by Prof. Lloyd. There is one thing I have not heard—were any varieties mentioned in the discussion of the rust-resisting varieties?

PROF. LLOYD—This work was done simply with strains of the netted gem varieties, which is the standard market melon grown in this State; it is simply a strain of melon which has developed at Rocky Ford during a number of years' experience. It is simply one that has been selected along the line of rust-resisting. When I heard of it, I thought it would not stand the rust in Illinois and I was very agreeably surprised to find it made the fine showing it did. At the three places where it was tried it made a remarkably good showing. As I mentioned in the paper, the seeds were saved from the most promising vines, that is to say, they were planted in hills considerable distances apart and individual records kept of each vine, and seeds were saved from the most promising ones. The idea is to plant the seeds of each vine separately next year and then make further selections and see if we cannot get a strain of melons that will develop a rust-proof crop in Illinois.

MR. ECKERT—We are following the same thing in growing melons, we do not attempt to grow many, not more than two acres or so. We have had good success with netted Gems this year from seven-eighths of an acre, and if it had not been for the tremendous amount of rainfall just when the crop was at its height, we would have made a record on that plat of ground. This patch was planted rather late in May with some seed bought from Burrell the year before in Rocky Ford, Colorado, and it resisted the rust fairly well. Last year we had experience with Pollock's strain from Rocky Ford, and that was the best rust-resister we ever tried. Unfortunately we planted our melons of that strain early and we lost the whole crop. That is, when they came up we had some cold weather and we had to replant the entire patch and we had no Pollock strain melons, otherwise we could have given a comparison of the two varieties. We all know that this season and last season were two of the most trying seasons in the melon

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NETTED GEM MELON.

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business, and from what I have seen of these two strains, I believe that we will get as close to a rust-proof melon as it is possible, and I believe if the growers will select the best type themselves and propagate from that seed, they will pretty nearly get a good melon. Another thing I like about those two strains ,they run more true and more even to the true type of the gem melon that the market calls for, and that is worth a great deal in the market. We also bought of Burpee's best stock this year, and I must say there is no comparison in the value of them this season against the other two strains.

MR. STOOKEY—I would like to ask Mr. Eckert if he detected any sign of rust at all on the Burrell gem?

MR. ECKERT—I cannot say that we did. There were some wilted in the patch, but through the excessive rain we lost a great deal of the crop that would have matured ,but not through rust, through decay. We had a patch of seven-eighths of an acre of Burrell's gems. If the weather had been any way reasonable while the season was at its height, I believe we would have been able to show a record for sales of melons on this patch of ground. I cannot say that we saw any rust on that patch this year. But there was some wilt on that, you cannot get rid of it.

MR. STOOKEY—I grow a few melons as a side crop. I planted them on low land, bottom land, sandy soil that was well tiled and I got a good stand of them. I planted them along the latter part of May, and I do not think I ever had a nicer crop in my life, and I did not detect any sign of rust or blight and they are a great melon to yield. I believe they yield really more than the Rocky Ford. But while speaking of varieties, I have a variety that originated on my own place. I call them "Strawberry" Gem. It is a cross of the Long Island Beauty and what is known as the Strawberry melon. No doubt melon growers here know what that melon is; it is a large melon, but I find I can make more money out of this variety than anything I have ever tried yet. It grows very strong and fine; the rust does not seem to affect it so much. Of course we have the blight on it, but we practice spraying every season. We generally commence as soon as the plant is out of the ground and we continue during the season. We use a knapsack sprayer; from three to five acres is the largest we ever have, but we have had good results with those melons. I will give you the formula that I use, what is known as the soda Bordeaux. In this soda lye takes the place of most of the lime. The proportions are three pounds of sulphate of copper, one pound can of Lewis lye, five ounces of lime and thirty gallons of water. The copper is

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dissolved the same as in making the ordinary Bordeaux and diluted so as to make fifteen gallons. The can of lye is dissolved in two gallons of water and then diluted to five gallons. The lime is slaked in hot water and diluted to five gallons. After straining through a coarse cloth, the fifteen gallons of copper, five gallons of lime and five gallons of soda are mixed with water enough added to make thirty gallons. In mixing this, I just double this amount, make a barrel at a time and use this as the last spray. It does not color the melons like the common Bordeaux.

PROF. LLOYD—I do not want the impresison to go out that the Burrell gem is uniformly rust-resisting. As grown by Mr. John Blaine it rusted worse than any variety on the place; as grown at Kinmundy it rusted fully as badly as any melon. The chief objection to that melon as grown in this climate is that if the season is wet it splits very badly. The originator of the variety makes a statement to that effect, that persons located in localities where there is likely to be excessive rainfall during the ripening season would do well not to depend on this variety, because it is very likely to split open. If grown in irrigating countries, as at Rocky Ford, it is a fine thing. Probably you know that that melon has created more sensation on the Chicago market than any other varieties combined. I do not know of any variety which has sprung so suddenly into popularity as that melon; it has the reputation of being the finest melon that ever struck Chicago, but I would not advise people in this State to plant it very extensively for the market until they have tried it in a small way to see whether under their conditions they can grow it successfully, and without losing a large proportion of the crop through excessive rainfall.

MR. LLOYD—I would like to ask the two gentlemen who have spoken this afternoon whether they are talking about what is on the market called the Burrell gem, or whether they only mean they got the Burrell seed from Rocky Ford?

MR. ECKERT—It is the green melon I have been speaking of.

MR. STOOKEY—The seed is supposed to come from the originator at Colorado; it is a yellow variety of melon and whether it comes from him or not I do not know; I bought it in that way.

MR. ECKERT—I want to correct myself. I meant to say Burrell's stock seed, not a yellow variety. We had Burrell's stock seed—that is what I meant. The names being so identical, I made a mistake, saying Burrell's gem, when I meant Burrell's stock seed. We used Burrell's stock seed and that melon this season was,

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considering the season and withstanding the rust, as it did practically, quite satisfactory, and as I said, we had Burpee's stock seed and that was practically worthless, besides Burrell's stock seed.

MR. LLOYD—In what way do you make the comparison between those melons?

MR. ECKERT—I make the comparison in this way,—from Burrell's seed we got fine even melons of high quality that ran very uniform, and our sales ran very heavy from a tract of seven-eighths of an acre, and a tract twice the size of the Burpee seed planted a few days later and which had an excellent start, practically no rust in it when it started, and the crop was well set, did not give us half the melons which the patch of Burrell's stock seed did, and furthermore the trade was very highly pleased with the quality of the Burrell melon. The quality of the Burpee melon was not near the quality of the Burrell. We have planted considerable Pollock seed; the year before this we tested five or six of these different strains, and as you all know we had a bad year for rust, the Pollock strain was the only strain that resisted almost entirely.

PROF. LLOYD—I will state that the remarks I made in regard to the Burrell gem applied to the salmon-fleshed melon known as the Burrell gem and which is marketed extensively by the Ordway Asociation of Colorado. That is the melon in regard to which I made the remarks in reference to rusting. The Burrell stock seed is what the gentleman had reference to, and I want to say that my opinion regarding that in reference to producing a high quality of melons in Illinois concurs fully with the expressions he has made.

ASPARAGUS GROWING.

RICHARD C. FUCHS, BELLEVILLE.

Asparagus being one of the first vegetables from the field in spring and being very palatable, makes it one of the most popular vegetables in places where it is known.

In the last years the consumption of asparagus has increased very much, partly because it is being canned, which makes it available at any time of the year, and partly because many people eat it now who did not eat it formerly.

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It is strange that a vegetable which has been cultivated over two thousand years should still be so little known by many people and by many not known at all.

It seems the taste for asparagus must often be acquired. Some persons who eat it for the first time do not like it at all, and later will eat it with a relish. Probably this is the reason it is little grown in some localities. So with the lengthening of the season by canning and to some extent by forcing, and by more people eating it, it is probable that the consumption of asparagus will increase much more.

Asparagus is native to Europe and Asia. Ancient writers say that it was first grown as a medicinal plant and then as a vegetable. It seems to have been a favorite even in those days. It is supposed to have been grown generally in Europe four hundred years ago. Early settlers brought seed with them to this country, and it seems it thrived from the start.

Most asparagus is grown near large cities or in good localities for growing with good shipping facilities. In small cities or towns not located near larger cities it is used very little.

Asparagus can be multiplied by dividing old roots, but this cannot be recommended. It is generally grown from seed in a nursery bed and then transplanted to the field where it is to produce.

To produce good seed, one or two weeks before the close of the cutting season choice plants should be selected from a field which is being cut for market. No abandoned field or field that is not old enough to be cut or volunteer plants should be near the selected plants, so the selected plants will not be pollinated by inferior ones. Only one or two shoots should be allowed to grow up from the selected plants, and the selecting should be done in not more than two days, so all the plants may bloom at the same time.

Asparagus being dioecious, that is, male and female, about one male to five female plants should be selected. Male plants generally produce larger and not as many shoots as female plants, so the plants may be selected accordingly.

The seed should be sown as early in spring as the ground can be worked properly. It may be sown in drills from eighteen to twenty-four inches apart and covered about one inch with fine soil, then mulched just enough to cover the ground with fine manure

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to conserve moisture and to prevent the soil from caking after heavy rains. When the plants are well started they should be thinned to from two to three inches in the row.

The soil should be kept well stirred throughout the growing season. With favorable weather plants should be strong enough to transplant when one year old, and are preferable to older plants. A good soil for asparagus is one which is well drained and retains moisture well.

The plants should be set from one to two feet apart in the rows, with the rows eight feet apart. When planted this way the tops will be exposed to the air and sun, the roots will not be crowded and the field will produce better shoots and be longer lived than when closer planting is practiced.

When green asparagus is desired the plants need not be set deeper than from four to six inches. For white asparagus straight trenches may be made with a spade or plow, from twelve to eighteen inches deep, then a little top soil may be put in the bottom, on this the plants with the roots spread in a horizontal position and covered with three or four inches of fine soil; then mulched with about four inches of manure that is free from lumps. The trenches should not be filled the first year and should be made so no water will stand in them. The second year a few inches of soil may be worked into the trenches with a cultivator. The third year the ground may be worked level and a few asparagus may be cut, but the cutting season should not be longer than two or three weeks. The fourth year, and after, the asparagus may be cut from five to seven weeks and in some soils longer without harming the plants. When the production falls off without any apparent cause in regard to the weather, the cutting season should end.

To prepare a field for the cutting season, the ground may be worked with a cultivator and harrow, then ridges plowed up over the rows and worked with a disk cultivator or a V-shaped drag.

To get a larger percentage of white asparagus a field should be cut once or twice a day.

The shoots should be graded as to size and color, into three or four grades, and bunched into convenient size for market.

After the cutting season the ridges should be plowed apart and the field harrowed. When the tops have grown up some ground may be worked up to the stems to prevent the tops from blowing over easily by strong winds.

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Probably the best time to fertilize a field is just after the cutting season, for this is the time that the roots store nourishment for the next season. A field should be cultivated often enough to keep the soil loose and free from weeds.

The harm from insect enemies is not generally serious; but the damage from rust has been very extensive.

Spraying with Bordeaux mixture for the rust has not given very satisfactory results. Sub-limed or flowers of sulphur dusted on the tops when they are wet several times during the summer will give good results if the sulphur is not washed off too soon by rain. Sulphuring should be started as soon as the leaves are developed and before any rust appears. Much can be done to prevent rust by cultural methods.

When asparagus is planted in well-manured soil which retains moisture well, the plants will be more vigorous and will have more strength to resist the rust. Rust will not readily develop without dew, so a high location should be selected which slopes to the east, so the sun can dry the tops early in the day.

No trees, buildings, or other obstructions to winds should be near a field, as air and wind help dry the tops more quickly.

No abandoned field or volunteers should be allowed to grow. The rust would start on these and spread to the field

The plants should be set far apart to give the tops air and the roots more space for nourishment, which will give the plants more vigor to resist the rust.

DISCUSSION.

MR. STANTON—I think that is something that appeals to those of us who live in the country. We do not know how to raise asparagus in the country and in villages where we have not a good market, we do not have it. It is not alone the people who are here who are benefited; these papers are published and distributed all over the State, so that it will be for the benefit of everybody that gets the volume.

MR. RIEHL—There was nothing said in regard to varieties and while in my experience I find that such a thing as a distinct variety in asparagus is not to be had, I think there is a difference in the strains of seed offered under the different varieties. The best that we have tried yet is the Palmetto. The Columbian Mammoth White gives a larger percentage of light colored canes than any of

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the others, and those are to be avoided. If we are sending asparagus to the Chicago market they want them there just as green as they can get them. The Palmetto not only is large and yields well, but it is earlier than the other kinds we have tested. Conover's Colossal is one that is perhaps most largely grown and it is all right, but we prefer the Palmetto to any of the others.

MR. MENDENHALL—I do not believe there is anything grown in the garden that is easier grown than the asparagus, and any one that has any sort of garden at all can raise it. It is a very simple matter to put it out and after you have once got a patch started, there is no end to the number of years that it will keep on growing, and it requires so little attention that it has always been a wonder to me that more people are not growing asparagus.

INJURY TO FOLIAGE BY SPRAY MIXTURES.

C. S. CRANDALL, UNIVERSITY OF ILLINOIS.

Spraying orchard trees as a protection against the ravages of insects and to prevent the development of injurious fungi has become an almost universal practice. Owners of commercial orchards have come to regard spraying as an essential and make advance preparation for it as regularly as for other orchard operations. Spraying has saved many crops, enhanced the value of others, and has been a great boon to the fruit grower. But the good derived from the practice has not been unmixed with trying experiences. Unsatisfactory results have sometimes attended and there have been many complaints of injury to fruit and foliage. Some have even gone so far, under the sting of poor success, as to condemn the process entirely, but in these cases I apprehend that ill success resulted more from inexperience than from any fault inherent in spraying itself.

It is an unpleasant fact that much spraying is done badly; this means that much money is thrown away. This arises mainly from carelessness and inattention to details, and is avoidable.

The commonly observed sources of trouble in spraying are three in number—namely:

1. The use of impure or improper materials, as for example, an adulterated brand of Paris green which contains an undesirable amount of free soluble arsenic, or the use of air slaked lime in

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making Bordeaux mixture. There is hardly an excuse for the use of air-slaked lime, and trouble with Paris green can be avoided by purchasing a brand of proved merit.

2. Carelessness in making the spray compounds. Guessing at weights and measures and mixing the ingredients in what happens to be the most convenient way without reference to what has been demonstrated to be the right way. These are easily avoidable sources of trouble for which there is no excuse.

3. Improper and ineffective application. Much material is wasted and possible benefits are lost through poor work in application. Right application depends upon the man who handles the pole and if this man is inattentive, lazy, or in too great haste to finish an, at best, unpleasant task, there is certain to be uneven distribution; parts of trees within easy reach sprayed in excess and more remote parts untouched.

It is difficult to eliminate this source of trouble because it depends upon the character of the help obtainable, and often this is inefficient and unreliable. The nearest approach to a remedy is reached in as close and constant supervision as it is possible to give. Of these three sources of error the first two can be entirely eliminated and the third greatly mitigated by that reasonable care that is commonly given to other branches of the orchard business. For the attainment of best results it is necessary to keep clearly in mind the purpose for which the spraying is done and to respect the smallest details that promote good work and count for efficiency.

But even when all known precautions have been taken and everything possible done to promote success, difficulties are sometimes encountered. Leaves are burned, fruit is russeted, and epidemics of chlorotic foliage occur that affect the performance of the trees. These troubles are very frequently complained of, and, while in many cases these injuries result directly from errors in practice, there have been a sufficient number of cases of injury following spraying by experienced and careful men to show that injuries are not always preventable.

In the conduct of spraying experiments by the experiment station, injuries similar to those reported by owners of commercial orchards have been sometimes experienced. Naturally the question of the cause, or causes came into prominence and, together with the frequent inquiries received, led to the undertaking of an investigation into the whole matter of injury to foliage by spray materials.

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Work was commenced in 1905 and is still in progress. Two years ago at this time, in a paper before the State Society, some phases of the work were discussed, and the intricate nature of the problem pointed out. At the present time certain other phases may be briefly discussed, although the investigation is by no means complete and still presents many unanswered questions; and in spite of the fact that writing from incomplete data, not yet thoroughly digested, is not satisfactory either to the writer or to his audience.

The injuries which have been under consideration are:

First—The burning or "brown-spotting" of parts of leaves; and,

Second—the yellowing of entire leaves and their speedy fall.

Just what relation the two injuries have to each other is not yet known. In certain cases the yellowing has appeared to be a supplement to browning. Badly brown-spotted leaves became yellow and fell; in one case, of 1,000 yellow leaves gathered under a tree each had several to many brown spots, or else had some portion of the margin browned.

On the other hand, leaves free from brown spots may become yellow and fall. Yellowing is commonly epidemic in character and may occur three or four times in a season. Brown-spotted leaves may turn yellow and fall, or they may persist and the uninjured portions continue to perform their functions until the end of the season.

The beginning of yellowing appears to prompt the completion of the absciss or separative layer at the base of the petiole and within forty-eight hours the leaves are ready to drop at the slightest touch. A shower of rain during an advanced epidemic of yellowing will greatly change the appearance of affected trees by removal of all the yellow leaves.

Of the two troubles the yellowing is the more serious because affected leaves are entirely destroyed. It is also more erratic in regard to appearance and duration and presents more anomalies in development. The causes, too, are more obscure and more difficult to prove. Brown-spotting is of various kinds and degrees, and while we are here directly interested only in brown-spotting as a result of spraying, it should be understood that leaves may develop brown spots from causes other than spraying. Late spring frosts and cold storms are sometimes accountable for the browning of foliage as was the case in many orchards last spring. The injury

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noted was of uneven distribution, being most pronounced where exposure was greatest, and gradually decreasing until it disappeared in the more protected portions of the orchards. Leaf tips and margins were most affected, but often there were irregular browned areas, in the body of the leaf, disconnected from the marginal injury. Certain fungi cause brown spots that are often mistaken for injuries by spraying. In the early stages of development these spots are sharply defined, but are usually of a lighter shade of brown than are the spots resulting from copper poisoning. Later, the fungus spots commonly coalesce to some extent, forming irregular patches.

In the case of Phyllosticta, the most common fungus affecting apple leaves, the formation of the black fruiting pustules, together with the light gray color of the partially separated cuticle are distinguishing features easily recognized.

Brown spots following the application of Bordeaux mixture or Paris green, or a combination of the two, result from the tixic action of copper or of arsenic, or of both. These substances, in some soluble form, penetrate the leaf tissues and kill the cells which then take on the brown color.

From the fact that only soluble forms of copper or arsenic work injury to foliage, attention has been directed to the production of combinations that should contain insoluble compounds of the copper and arsenic. The formulas now in common use attain this end as nearly as possible. Paris green that has been well made and which contains the smallest possible amount of soluble arsenious acid is insisted upon and to this lime is added to still further reduce the soluble arsenic and insure greater safety. The combination of lime and copper sulphate in making Bordeaux mixture is regulated with a view to the complete precipitation of the copper in insoluble form. The formulas recommended are the results of careful experiments and are the best that it has been thus far possible to devise. But injury, more or less serious, not infrequently follows the use of these formulas. Theoretically, they are safe, practically not always so, and we account for the injuries occurring in one of two ways; either there is some error in the materials used or in the manner of combining them; or changes take place after the spray has been spread upon the leaves.

By the application of careful tests it may be shown that the mixtures, at time of spraying, are safe; then if injuries follow they must be due to changes occurring after deposition of the compounds upon the leaves. What are the changes that take place? What are the agencies through which they occur? When do they

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take place? What is their rate of progress? These are questions that must be answered before it is possible to seek intelligently for means to prevent the changes that result in injury.

It is evident that the problems are chemical in nature. The changes are not visible. We can not see them, and only know that they must have occurred through the results which follow.

It was hoped that work on the chemical phase of the problem could be commenced in the spring of 1906, but the season was well advanced before the necessary arrangements could be perfected. The experiments proposed were started on July 21 and continued until about the middle of October. They were designed for determination of the changes taking place in Bordeaux mixture after it is sprayed upon the leaves; for observations on the development of leaf injury following these changes; for testing the adhesiveness of the mixture and for the accumulation of data regarding the relation between changes in the mixture, leaf injuries, and atmospheric conditions. The plan was to catch rain and spray waters dripped from leaves and by analysis determine the compounds washed off. Five year old apple trees were used in the work. Each of the trees included in the experiments was surrounded, at point above the greatest spread of the tree, with a heavy iron ring supported by four posts, so braced as to prevent any displacement by wind. From this ring a funnel of table oil-cloth was suspended and so adjusted about the tree trunk that no water could escape except through the mouth of the funnel, which opened into a large crock, supported in proper position. The arrangement as described was then surrounded with a burlap apron to prevent rain from driving against the funnel and into the crock.

Tree No. 33 was sprayed heavily three times, on July 21, with Bordeaux mixture and Paris green made on the 4-4-¼-50 formula. Each application was allowed to dry before the next was applied. When spraying was finished the foliage was thoroughly coated. The funnel was then adjusted and the tree left exposed to the sun and to any rains that might fall. On July 28, seven days after spraying, the first rain came as a thunder shower with precipitation amounting to .55 inch. The water falling within the ring and passing over the sprayed leaves to the crock below measured out 11.28 litres (approximately three gallons). This was taken to the chemical laboratory, filtered, concentrated by evaporation, and stored for subsequent analysis. Other rains followed at intervals of from one to nine days until October 3, on which date work with this tree was discontinued. During the period of seventy-four days from July 21 the tree was subjected to the waters of twenty-

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one rains which gave a total precipitation of 7.3 inches. The twenty-one lots of water collected ranged between 304cc and 20,191cc, from less than one pint to more than five gallons. The aggregate was a little more than thirty-three gallons.

Tree No. 34 was provided with funnel and drip crock as described for tree No. 33. In addition it was provided with a cover designed to protect the foliage from all rain and dew. This cover was placed over the tree each night and in day time whenever there was immediate prospect of rain. The tree was sprayed on July 24 with the same mixture and in the same manner as tree No. 33. After an interval of one week the tree was sprayed with cistern water, using approximately two and one-half gallons, and this was repeated four times at intervals of one week. Then the cover was removed permanently and the tree subjected to rains, eleven in number, that fell between August 23 and October 3.

Tree No. 35, arranged in like manner, was sprayed heavily with Bordeaux on July 25, protected by cover from all meteoric waters and sprayed with cistern water at intervals of one week until September 26, making nine applications. The cover was then discontinued and the tree subjected to two rains in October, the last on October 18.

The treatment of tree No. 36 differed from that of No. 35 in that it was sprayed four times at seven day intervals, and then was sprayed once more after an interval of twenty-eight days. Five applications in all, with complete protection from rain and dew during the period from July 28, the date of spraying with Bordeaux, to September 22, the date of the last spray.

One other tree of this series—No. 47—was brought into commisison on August 23 to test the action on foliage and the adhesiveness of a combination of Bordeaux mixture with arsenate of lead. This tree had no cover, was exposed to the elements, and during the period from August 23 to October 3 received the precipitation from eleven showers and storms, amounting to 3.3 inches.

It is not the intention at this time to go into the details of the results of chemical analysis because the chemical work is not yet complete, but to confine present statements to some of the general conclusions that the work of the season seem to warrant.

But first a word regarding the action of the Bordeaux upon the foliage. The spray applied to these five trees was much in excess of applications made in common practice; leaves and branches were thoroughly coated and were uniformly of a Bordeaux blue color. Notwithstanding the heavy application injury to

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foliage was extremely small. Two days after the rain of July 28, that is to say, nine days after spraying, a slight browning on the margins of a few leaves of tree No. 33 was observed. This injury was neither conspicuous, nor in any way serious. Two weeks later, immediately following the showers of August 10 a few small brown spots were noted on leaves of this tree. The three trees provided with covers were even more free from foliage injury than No. 33. Such injury as appeared took the form of burned tips. This occurred on a few leaves of each tree. There were none of the characteristic brown spots.

A few yellow leaves fell from the different trees at various times during the season, but yellowing was in no sense epidemic, nor can the small amount of yellowing that occurred be ascribed to action of the spray applied, because a somewhat larger number of leaves turned yellow and fell from trees of the same age that had not been sprayed. The leaves that became yellow and fell were for the most part the small basal leaves of clusters, many of them little larger than bud scales.

The adhesiveness of the Bordeaux was all that could be desired. For some weeks there was no apparent diminution in the intensity of the blue color. Later in the season this intensity of color was somewhat reduced, but when the leaves were picked from the trees in October they were still conspicuously coated with the mixture. Every rain or spray to which the trees were subjected washed off some Bordeaux which appeared as insoluble particles and flakes in the sediment collected with each lot of drip water. The amount of this insoluble copper was greater in the first waters than in those following, but the aggregate amount thus removed was not enough to appreciably diminish the blue coating of the leaves.

The analytical work on the drip waters collected is being performed by Mr. O. S. Watkins under the direction of Dr. H. S. Grindley. This work is not complete, but the following statements are warranted by the work thus far done:

In making the Bordeaux mixture with which the trees were sprayed all the copper sulphate in solution was precipitated in the form of the insoluble copper hydroxide. No basic copper salts were formed. When a portion of the freshly made Bordeaux was allowed to stand until the precipitates had settled, the clear supernatant liquid contained no copper as was repeatedly shown by the application of the most delicate tests.

The Bordeaux mixture as made was strongly alkaline and it has been demonstrated that the lime used was 4.45 times the

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quantity necessary to change all the copper sulphate into copper hydroxide. This alkalinity, so marked at first, was rather readily neutralized or washed away after exposure upon the leaves. There was a gradual, although not perfectly uniform decrease in alkalinity until, towards the end of the experiments the drip waters were practically neutral.

Soluble copper salts were found in the drip waters from first to last; the amounts fluctuated, but without apparent relation to time intervals, or to amounts of rain or spray. With one exception the amounts found were uniformly higher during the period from September 3 to September 20 than had been found previously, or that were found later. This seems to point to the presence of certain atmospheric conditions, during this period, that were especially favorable to the production of soluble copper salts from the insoluble copper hydroxide.

The finding of soluble copper salts in the first drip waters, collected only one week after the spray was applied, is directly contradictory to the theory that the copper hydroxide is not rendered soluble so long as lime is present in excess; and at this time lime was present in quantity as was shown by the alkalinity of the waters. The results are also opposed to the results obtained from certain laboratory experiments. For example, two small apple trees in pots were sprayed alike with Bordeaux mixture in the laboratory on May 24 and placed in a south window fully exposed to light and air; here they remained for 54 days. The foliage of one of the sprayed trees was moistened with rain water on 46 days of the period; only sufficient water was used to moisten the leaves, not enough to drip. The foliage of the other tree was kept dry.

On July 17 the leaves of the two trees were carefully and thoroughly washed in separate dishes of neutral distilled water. The results of analyses showed no differences between the two trees. No soluble copper salts were washed from either tree.

A further experiment was made with Bordeaux dried down in glass dishes and allowed to stand exposed to the air for 65 days. During this time the Bordeaux in one dish was moistened on 54 of the 65 days, while that in the other was kept continuously dry. Careful determinations made at the end of the 65 day period proved the entire absence of any soluble copper salts. In both these laboratory experiments it was found that all of the alkaline lime had been changed to neutral calcium carbonate.

The conflicting results obtained from these field and laboratory experiments regarding soluble copper salts indicate clearly

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that there are other active factors not yet considered. These factors must be discovered, isolated, and separately tested before conclusions as to the causes of opposite results are possible.

The chemical work on the drip waters suggested still other features upon which more information was desired. It seemed essential to have more data regarding the character and rapidity of the changes in the excess lime, and the relation of these changes to atmospheric conditions; to test the action on foliage of lime alone; to know the effect of maintaining an excess of lime on the sprayed leaves by additional applications of milk of lime; and to test the relative effect of long continued gentle rain or spray as compared with short dashing showers, or spray under high pressure. These and other questions of like nature suggested modifications in field practice and served as a basis for outlining a more extended series of experiments for the following year.

During the season just ended and covering the period from June 10 to October 26, twenty-eight trees were included in the experiments; each provided with funnel and accessories necessary for collection of rain and spray waters. This number did not embrace all the experiments that had been outlined as desirable, but was thought to be all that could be successfully managed at one time because of the large amount of detail work involved. Rains were frequent and abundant from the beginning of the work until the end of August and proper care of the waters collected taxed the resources of the department to the utmost. However, the work undertaken was brought to a successful finish, as far as the field part is concerned, and with very few minor accidents.

It will require several months to complete the analytical work, and until that is done and the results digested, opinions regarding the problems in hand must be held in abeyance.

A few observations, hastily gleaned from the records of the season, regarding the action of the spray mixture on foliage, may be briefly mentioned at this time. Of four trees heavily sprayed with Bordeaux mixture and Paris green (4-4-¼-50) on June 11, two were provided with covers to protect from meteoric waters, and during the period ending October 15 were sprayed eighteen times, at seven day intervals, with cistern water; each application approximating three gallons. The two other trees were left exposed to rain and dew and during the same period received the waters from 23 showers and storms, giving an aggregate precipitation of 13.11 inches.

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The first rain following spraying came on June 22, and two days later a few brown spots appeared on leaves of the uncovered trees. Other rains followed, but no increase in the amount of brown-spotting was observed. The Bordeaux adhered well; as the season advanced the intensity of color was perceptibly diminished, but when the leaves were picked on October 31 most of them were still well coated.

Foliage of the covered trees remained entirely free from brown spots and there was scarcely any change in the appearance of the blue coating throughout the season. It appears that artificial spray is a less effective agent in the removal of Bordeaux mixture from foliage than rain. It also appears that rain may cause brown-spotting, and that artificial spray is not followed by brown spots on the foliage.

This observation is supported by the records of other trees. Of 12 trees provided with covers, sprayed with full strength Bordeaux mixture, and subjected to artificial spray, not one had the foliage injured by brown spots, while all of the 14 trees not covered and subjected to rain had the leaves more or less marked by brown spots.

The foliage of these uncovered trees sprayed with Bordeaux mixture containing an excess of lime, as is the case where the 4-4-50 formula is used, was not seriously injured, but where the lime was considerably reduced the injury was serious.

Four trees were sprayed with Bordeaux mixture made on the 4-1-50 formula. Two were covered and artificially sprayed, and two were left exposed to rains. All four had the foliage brown-spotted, but the injury to the uncovered trees was much more serious than to those covered. Leaves of the uncovered trees were so badly burned that a large portion of them fell. Two other trees treated with a Bordeaux mixture made with only ½ pound of lime to 4 pounds of copper sulphate had the foliage injured to about the same extent as in the case where one pound of lime was used. The one pound formula contains sufficient lime to precipitate all the copper; the half pound formula does not. Injury was about equal in both cases. In both cases there was an absence of excess lime.

On two trees the 4-4-½-50 formula made up with air slaked lime was used. Here the injury amounted to the complete destruction of the foliage. The action was the same as would have followed application of a plain solution of copper sulphate, 4 pounds to 50 gallons.

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Bordeaux mixture made with air-slaked lime or with a greatly reduced proportion of good quick lime is not good Bordeaux. It is destructive to foliage, and it is not adhesive.

Treatment with milk of lime, 4 pounds to 50 gallons, at weekly intervals, in order to maintain an excess of lime following heavy spraying with 4-4-¼-50 Bordeaux mixture appeared to accomplish the purpose. The foliage remained free from brown spots. Adhesiveness of the Bordeaux was promoted and the excessive amount of lime applied had no apparent injurious action upon the leaves.

DISCUSSION ON PROF. CRANDALL'S PAPER.

MR. PERRINE—I would like to ask if you got some copper in the drip from those trees where the lime was added later; did you get some copper there as well?

PROF. CRANDALL—Yes, there was some copper there, but in smaller amount.

MR. PERRINE—Then the lime seemed to hold the copper on?

PROF. CRANDALL—Yes, the Bordeaux applied on the leaves was a great deal obscured by the constant coating of lime, but examinations showed that the Bordeaux was there, and then another point, on these trees every bit of water that we took would have a little sediment in it, mostly lime flakes, but in every case we found particles of Bordeaux mixture, they were small, not so much as from some of the trees where the lime was not used. I cannot say just why, but it seemed in every way to promote the adhesiveness of the Bordeaux Mixture.

MR. PERRINE—On the theory that the lime will tend to counteract the other sprays, that is not correct.

PROF. CRANDALL—It does not seem to work correctly in this case at all. You can see that our chemists have a great task before them. We had in excess of 600 lots of water from these trees, they all had to be evaporated down. In addition to the water, each time there was a body of fallen leaves and solid sediment at the bottom of each funnel; just above the crock we placed a cheese cloth screen and every time we took out a batch of water we would take that off and take out any sediment that had collected there, watching that carefully to get any Bordeaux that might be adherent there. Then the liquid was filtered and we have just as many solid residues as we have liquids, that would make something over 1200, and then the batch of leaves each time would make some-

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thing over 600 more, so that we have over 1800 lots of material that have got to be subjected to analysis, and it is going to require a large amount of work, but we are strongly in hopes that many of the questions that have been raised, we will be enabled to answer when they get this work completed.

THE PRESIDENT—You find the excess does not reduce the effectiveness of Bordeaux?

PROF. CRANDALL—So far as we can tell, it does not reduce the effectiveness. I might say as far as apple scab is concerned we had no development of it this year, and I cannot say about that, but I am confident that if scab had appeared, the scab would not have developed. The Bordeaux was still on those leaves when we picked them the third of October.

Adjourned.

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HARRY BEAUMAN

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Harry Beauman.

In the death of Harry Beauman, of Tunnel Hill, horticultural interests, especially those of Southern Illinois, lost a young man of great promise. Mr. Beauman, who died October 28. 1907, aged thirty-six years and eleven months, was one of the most progressive of the younger fruit growers of Southern Illinois. His beautiful orchards attested well his love for his profession, his continual planting of orchards proved his faith in his locality for apple production, and his successful management of several hundred acres of hill farm land indicated correctly his energy and executive abilty.

Though not closely associated with the State Horticultural Associations officially, Mr. Beauman was very active in all local agricultural and horticultural societies, including the Johnson County Fair, of which he was a director.

Harry Beauman stood high in his community as a useful and influential man and his loss is keenly felt throughout the neighborhood in which he lived.

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Allen Cope.

Allen Cope was born August 4, 1827, near New Waterford, Columbiana county, Ohio, where he resided until 1845. For nine years he resided in Salem, Ohio, where he was engaged in a mercantile business. In 1854 he came to Fairfield, Illinois, where he studied and practiced law with Judge Charles Beecher. Mr. Cope's career as a horticulturist began with his removal to Tonti, where he came in 1860. He planted forty acres of apple trees during the springs of 1861 and 1863, a very large area, indeed, at that time. It is worthy of note, too, in this connection, that he was one of the first to plant largely of the Ben Davis apple, about half of his orchard being set to that variety. This venture in the orchard business proved successful and as this orchard began to fail he planted again from time to time and indeed his labors ceased only with the coming of his long rest.

Mr. Cope was an active member of the State Horticultural Society and of its sub-society, the Southern Illinois Horticultural Society.

In Allen Cope many of the elements of a sturdy and admirable manhood appeared. A genial and companionable personality, he was quick to become the center of an interested and friendly association. He was a fast and true friend, an agreeable and accommodating neighbor. However, he was most loved by those who knew him best, the members of his own household. Here he was a father indeed to his family and a thoughtful and devoted husband.

Allen Cope died in Tonti, Marion County, Illinois, October 24, 1907, aged 80 years.

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ALLEN COPE

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PROCEEDINGS

OF THE

ALTON HORTICULTURAL SOCIETY

FOR 1907

REPORTED BY THE SECRETARY,

MISS HANNA DAVIS.

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OFFICERS FOR 1908.

PRESIDENT.....E. H. RIEHL, North Alton
FIRST VICE PRESIDENT.....W. WESCOAT, Alton
SECOND VICE PRESIDENT.....E. HOLLAND, Alton
TREASURER.....F. HOFFMEISTER, Alton
SECRETARY.....MISS HANNA DAVIS, Godfrey

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ANNUAL MEETING.

The annual meeting of the Alton Horticultural Society was held on Thursday, January 10, 1907, at Hotel Madison. Vice President H. G. McPike in the chair.

Minutes of previous meeting read and approved.

Reports of Secretary and Treasurer were given. Before the election of officers the President urged that all present as far as possible vote for young men to hold offices in this Society, so in years to come the Alton Society will not be forced to disband owing to small membership. Election resulted as follows:

President, E. H. Riehl, North Alton; First Vice-President, Wm. Jackson, Jr., Godfrey; Second Vice-President, Wilmer Wescoat, Alton, Secretary, Miss Hanna Davis, Godfrey; Treasurer, Frank Hoffmeister, Alton; Librarian, H. G. McPike.

Standing Committees—Orchard Fruits, E. Holland; Small Fruits, Jas. Davis; Vineyards, J. M. Pearson; Vegetables, Wm. Jackson; Ornamental Planting, H. G. McPike.

Mr. Pearson moved that Mr. McPike be requested to make a list of all books in the library of this Society and present same at the next meeting. Mr. McPike asked the permission of the Secretary to assist. Motion carried. Mr. Wescoat being unable to be present, asked by letter for information of the bag worm, found on his maple and poplar trees, and the remedy to destroy them.

Mr. Pearson—The bag worm is not often found on trees other than the evergreens. In a late report Prof. Forbes said when the insect is feeding on green leaves during May and June, it is not difficult to kill them with Paris green. Later in the season they make and enter those sealed bags. The only remedy then is to pick them off and burn them.

All bills presented were ordered paid, leaving a balance of about $15 in the treasury. A vote of thanks was given Mr. Daniels for the use of the parlors to hold this meeting.

On motion the Society adjourned to meet at the call of the Secretary.

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MARCH MEETING.

The March meeting of the Society was held the twentieth at the residence of Mr. J. M. Pearson, near Godfrey.

Meeting was called to order by Vice-President W. Wescoat in the chair.

ORCHARD FRUITS.

MR. JACKSON—My peach trees look well, almost in full bloom. This is very early for fruit trees to blossom in March.

MR. HOFFMEISTER—Many trees are too full of bloom, especially plums. Still this is not a sure indication of a crop.

MR. MCPIKE—Pears with me are strange. The trees bearing heavily last year will have only a small crop this season. Apples will soon be out. Spraying should be started very soon now, even if early in the season.

QUESTION—Do all apples bloom at the same time?

MR. MCPIKE—The early varieties always come out first.

MR. HYNDMAN—My Damson plums are too full of buds. Other trees look well.

MR. PEARSON—I am not anxious for my fruit trees to bloom so early; there may be frost to kill most of the fruit. If it was a month later we would not be safe. My peach trees did not make as good growth as I like to see. Not enough to produce a very large crop. Have done no pruning yet. Will wait till the buds are set, and shorten in the trees later.

MR. WESCOAT—I was in an orchard last year where the trees had been cut back to a stump. The owner said in this way they were renewed every few years.

MR. HOFFMEISTER—You cannot prolong the life of a tree by the close cutting back. The stump will split from the force of the wind or weight of fruit.

MR. PEARSON—Orchardists are now pruning apple trees so most of the fruit can be picked from the ground. This is economy.

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SMALL FRUITS.

MR. JACKSON—All small fruit looks well, but not so far advanced as the trees are.

MR. MCPIKE—My raspberry and blackberry plants will soon be in bloom. Gooseberries and currants are also very early.

VINEYARDS.

MR. PEARSON—Vineyards should before this time be pruned and tied up. The buds are pushing out and show enough for a good crop.

MR. JACKSON—One new grape called "Green's Early" has now grown to about three inches. Just in time for frost.

MR. MCPIKE—I have not yet finished tieing up my vines, but find the Niagara the farthest advanced. One vineyard planted in '64 has borne each year and are now thrifty and healthy looking. The vines came from California.

A recess of one hour was taken for luncheon and the meeting was again called to order.

VEGETABLES.

MR. JACKSON—Those who have not planted vegetables should do so at once, then take good care afterwards. I have a seed sower called "Planet Jr." It is the best machine I know of to sow garden seed with and may later be used as a cultivator.

MR. HOFFMEISTER—I advise the planting of the large carrots just for horses.

ORNAMENTAL PLANTING.

MR. MCPIKE—At this time of the year it is remarkable to see so many different kinds of shrubs and bulbous plants in full bloom.

MR. JACKSON—What shrub would you plant for a hedge?

MR. MCPIKE—I saw a hedge at Mount Vernon planted by Gen. Washington; this was Barberry and still very beautiful and in perfect condition.

MR. PEARSON—In planting ornamental trees I do not want those which draw all their substance from the ground surface for there will not be any grass grown under them. This is my reason

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for disliking the soft maple. During the next month everyone should plant something to help beautify their place or home, and make it more pleasant to live in.

On motion the Society adjourned to meet at the call of the Secretary.

JUNE MEETING.

The Society met June 13 at the home of E. H. Riehl, near North Alton. The weather was showery and the morning was spent in pleasant conversation till luncheon was served. The meeting was called to order at 1 o'clock.

ORCHARD FRUITS.

MR. HOLLAND—There will be only a small crop of apples and peaches and no pears excepting the Seckel, which show very good, and no doubt cherries.

MR. PEARSON—Peaches are only fair. Entire failure of pears and few apples.

MR. COOK, of Jersey County—There is no tree fruit on my place this year.

W. A. YOUNG, of Montgomery County—In my county there will be from five to fifty per cent of an apple crop. Rome Beauty and Duchess of Oldenburg are especially full and fruit smooth. Peaches are good and plenty on the trees. No pears. Japanese plums are good. Our native plums are a failure.

MR. J. N. COLMAN—Why have you such a good prospect for fruit and in this vicinity there will be so little?

MR. YOUNG—I can't answer that question. Such conditions exist every season—where in one neighborhood some will have abundance of fruit of one kind and on the next farm there will be none.

MR. MCPIKE—My early apples are good, also quinces. Bartlett pears are full but none of any other variety.

I feel it would be a waste of time and labor to spray a season like this has been.

MR. HURD—If nothing happens will have a good crop of apples. Romanite, Jonathan and Genet are extra fine. No peaches

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on my trees. No plums of any variety. At Plainview on the Snedeker orchard there will be a small crop of apples. Mr. Carlin of Jerseyville has greatly injured his apple trees this year by spraying with a solution made too strong.

MR. HYNDMAN—Will have few apples and perhaps one-third of peaches.

MR. REIHL—My Japanese plums are full enough, but the insects are very plentiful. Peaches are scarce except the Belle of Georgia, which is a fine white variety, ripens with Elberta. The Carman has some fruit. Apples are falling and by fall the supply will be small.

MR. HOLLAND—My Park's cling peach trees are full. This is a late red peach and very good.

SMALL FRUITS.

MR. PEARSON—My neighbors report only a small crop of strawberries, and the quality not up to the standard. The early and repeated frosts killed all the first blooms.

MR. HOLLAND—My blackberries and raspberries are good. Currants are damaged by a new bug which eats the leaves from the underside.

MR. COOK—All small fruit is very good. I only grow enough for home use.

E. H. RIEHL—Strawberries not more than one-half crop. Raspberries and blackberries are good. The latter rusting as usual. My remedy for rust is to cut it off as soon as it shows and in this way prevent this dust from spreading over the entire plantation.

MR. PEARSON—Let the Secretary tell of the fine blackberries they had a few years ago.

MISS DAVIS—They were affected with rust and winter killed. But we have a new patch that is in fine condition.

Mr. Riehl told of the new varieties of strawberries—one especially large called "Beedler" and several others that show well, but would not recommend to plant in large numbers till better known.

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VINEYARDS.

MR. PEARSON—Vineyards look well and are in good condition. The frost did not injure the vines as I thought it would.

MR. HOLLAND—I will renew my vines as they have been neglected.

MR. RIEHL—We need in this locality more late grapes. When Concords are gone our grape crop is at an end. One late variety called Kentucky is good. Also one called Admirable. Some like the Virginia seedling. Very early grapes are profitable.

MR. MCPIKE—The Goethe is considered the best late grape, but a shy bearer and easily winter killed. I am through pinching back and my vines look well.

MR. RIEHL—The Goethe seems to be a favorite in our Society. I think it is best to let it fruit on the old wood, as you do the Virginia seedling.

VEGETABLES.

MR. COOK—My garden is almost perfect, excepting a poor stand of Lima beans.

The question was asked, Is it too late to replant melons?

Mr. Riehl advised to plant again.

MR. PEARSON—Some of my enterprising neighbors have picked peas a week ago. I am a little late.

Mr. Riehl called attention to a fine lettuce called "Wonderful," two bunches filling a half bushel measure.

The committees failed to hand their reports to the Secretary, but will say Mr. Riehl had an excellent display of fine strawberries, consisting of eighteen varieties. Many showed very excellent quality, size and color.

The best collection of roses ever shown at this Society were on exhibition, from the Baby Rambler to the Cabbage rose, six inches in diameter, American Beauty, Paul Neyron. All the new and many of the old but beautiful flowers, well named "Queen of the Garden."

Before adjournment, Hon. N. J. Colman gave an interesting talk and made many friends among members.

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Mr. Pearson moved that Mr. Coleman be made an honorary member of this Society. Motion carried.

This is the first time the Society has met with this President, and all were pleased and delighted at the genuine hospitality.

Adjourned to meet at the call of the Secretary.

SEPTEMBER MEETING.

The September meeting was held on the seventh at the residence of Frank Hoffmeister, north of Middletown. The day was pleasant and attendance was good. The Secretary called the meeting to order. On motion Mr. McPike was asked to preside in the absence of the President.

ORCHARD FRUITS.

Mr. Pearson—In my neighborhood it is estimated that the peach crop will average from six to ten per cent of a crop this season.

Orchards of Elbertas are doing well, while peaches of other varieties are scarce. I had a few Seckel pears, and will have more Ben Davis apples than any others.

Mr. Holland—I have just returned from a trip through the northwest. There are few apples this side of Oregon. In the Columbia river bottom the tree fruit is wonderful. Peach trees do not grow as large there as here, and the fruit is not so good, but beautiful to look at. Insects of all kinds are plentiful and spraying is thoroughly done.

Mr. Pearson—Have you noticed that peaches on high land are better than on low grounds?

Mr. Holland—High ground seems to be the best for all fruit trees.

Mr. Jackson—My peach crop is very satisfactory. Not too many, but just enough to fill all orders at good prices. Land should be well drained for fruit trees.

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MR. MCPIKE—This has been the poorest fruit year ever known on my place. Apples and pears are an entire failure. Only a few peaches.

MR. JACKSON—Which will pay the best, a small crop of peaches at $2 the bushel, or a large crop at 50c?

MR. MCPIKE—The small supply will pay the best. As a full yield every year will soon destroy the trees.

MR. HOFFMEISTER—My neighbor has a splendid lot of peaches and I have scarcely any.

MR. W. D. ARMSTRONG—I have a new orchard of Elbertas and they are fine. The prices have been very high.

MR. POWLESS—On my place a new leaf mite has done some damage. They eat all the gum off the foliage and leave only the hard fiber. I have sprayed with a mixture of six pounds of sulphur, ten pounds of lime and twelve pounds of tobacco dust, and this has been beneficial.

VINEYARDS.

MR. JACKSON—On some vineyards the foliage is falling very fast and the fruit will not ripen when this condition exists. I have a good new grape called "Lucille."

MR. HOFFMEISTER—Grapes is the crop this season with me. The birds are eating them at present and will destroy abundance of fine fruit.

MRS. HOLLAND—I saw an arbor near Belletrees, and it was beautiful to see the great quantities of fine grapes.

MR. MCPIKE—Some varieties are ripening unevenly, though generally the crop and quality are good. Ladybugs are abundant and destroy the blue beetle, but the leaf roller is hurting the foliage.

Mr. Hoffmeister asked if the nursery inspector had been around.

MR. JACKSON—Yes. He was at my place one week ago. He told me of some San Jose scale on a part of my farm and I had the infested plants burned at once.

On Exhibition—From Mr. McPike, Sheldon, Bartlett and White Doyenne pears; from W. D. Armstrong, Seckel pears, Elberta peaches and almonds; from E. Holland, German and Italian

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prunes and Red Astrakan apples from Washington state; from F. Hoffmeister, four varieties of late peaches; from J. M. Pearson, good Seckel pears.

A good collection of grapes Mr. McPike showed ten varieties, all very good. A. B. Davis had four varieties, all excellent quality.

The collection of flowers was unusually good, all with one exception, from Mrs. J. L. Cramer, of Godfrey.

After spending a pleasant day, the Society adjourned.

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PROCEEDINGS

OF THE

EIGHTEENTH ANNUAL MEETING

OF THE

RICHLAND COUNTY HORTICULTURAL SOCIETY

HELD AT

Olney, Illinois, February 12, 1907

Reported by LEE WILSON, Olney.

ADDRESS OF WELCOME BY PRESIDENT J. F. JOLLY.

I am glad to see so many people interested in this meeting as we have here this morning. We have not always gotten together in the mornings. A number of things have happened since we were here before, and many very profitable to the horticulturist. It has been a year in which prices have been low and the great waste of apples has been a great loss to the horticulturist, and while we have striven for a number of years, many of us, in the line of horticulture, there are many things we have not learned, and there are many things we should learn, and one of them is that we should grow more number one apples. While we are spraying and cultivating and pruning, we have not yet learned to grow enough number one apples. Our waste is too great and while we all talk about finding some manner in which to use up our product which is not fit to be barreled, we should learn to grow less of that product, and until we do that, the horticulturists are not fulfilling their mission. We had a large loss this year, possibly some could not be avoided on account of the markets. We have always a new

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enemy to combat. This year I do not know that all the people in our country know, but we are verging upon a fight with the San Jose Scale, and while it has already in many places been kept back, it is a matter that should be particularly advertised. The sooner the orchard people take up the fight, the better they will be to get out of the fight. We have it. The sooner we confront it the better. A few years ago when this was new in our State, scientific people thought that we should exterminate the San Jose Scale by proper methods, but they have given that up. By proper applications we can keep it in check and can kill from ninety to ninety-five per cent. We have it in a number of places in our county, and we should all make an effort to check this as much as possible.

I have recently had a talk with Prof. Forbes, State Entomologist, who is regarded over the United States as one of the foremost, and he had just returned from a meeting of the entomologists of the United States at New Orleans and stated to me that he was glad to tell that there was nothing as good as sulphur and lime wash. Those things that are manufactured are largely made of crude oils and ruin it. The lime and sulphur wash is cheaper and better.

I do not know as I care to say anything more.

SPRAYING.

MR. EMERICK—I have been spraying for several years and have had pretty good success, am satisfied myself. Last year was the best I have ever had in spraying. I sprayed with whale oil soap and a preparation called Pyrox manufactured in the East, in Boston. The first and second times we sprayed with the two mixtures mixed together. I put it on with a good sprayer and the results were wonderful. I sprayed when the buds were so you could see the red, and the second time when the calyx was open. I waited until after the apples turned down, and went after them again and never saw a bug. July first there was not a hole in a leaf. Right across the road from me on both sides, on the south, east and west, the orchards were eaten into strong by June 1. There were no canker worms. When apples were of good size I never saw a worm, and when time for killing codling moth came there were none. Not a sign of any.

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I wrote letters to people asking them if they had put testimonials in the paper, and they said they used it on shade trees in the east. The name of the company manufacturing Pyrox is Bowker Insecticide Co., Boston, Mass.

Just on the other side of the fence, thirty feet from me, I could count 100 to 160 trees with codling moth where it had not been sprayed. I am well pleased with the results of this. All you have to do is to go to your tank and pour your water in. Whale oil soap is used. Another man used Pyrox alone and the results were only half what mine were. I used one pound of soap to the gallon, but this is stronger than it needs to be. The second time I used half as much. One hundred and fifty gallon tank cost me $3.00 every time I went out. Every $5.00 spent made me $100.00. The trees were twelve, thirteen and fourteen years of age. One hundred and fifty gallons will spray nearly 200 trees. The trees were covered perfectly.

MR. ZOOK—I do not believe you can cover a tree right with less than 2½ gallons to the tree of Bordeaux mixture.

MR. NAFFZIGGER—I hate to get up after Mr. Emerick. My experience is very limited in spraying. About five or six years ago I used Paris green, but last year I could not get away with the canker worm, so I used arsenate of lead and have used it since. Last year I sprayed with Bordeaux mixture, first before blooms were open and second time after the petals fell. I waited until September, then I noticed worm holes, but did not know at that time I should spray as late as that, but the Fruit Grower says must to kill canker worms. I am going to investigate what Mr. Emerick used, and think I shall use it.

MR. JONES—I used the same as Mr. Emerick, except the whale oil and soap. My apples were two to three together. There was no chance for insects to work.

MR. EMERICK—I believe that the soap has solved the problem. There is one thing about the mixture we use, there is no smell, but soap smells like dead fish, if any one ever smelled that. Insects will not touch the tree for ten days. Cankér worms will not touch the tree. This year was a good year, as it was dry. Where you apply the stuff to the calyx of the apple, no codling moth will lay an egg. This soap costs three and one-half cents per pound by the barrel, and there are 425 pounds in a barrel.

MR. HONEY—I could tell more about what I do not know about spraying than what I do know. I noticed what this gentleman said about 150 gallons to 200 trees. About eighty trees is about

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as much as I can spray with 150 gallons and then I did not think they were sprayed any too well. I think before we take up anything new we want tests like they make at experiment stations, such as may be sworn to and stood by. I do not think the gentleman has misrepresented it, but whether conditions and tests will bear out the thought that we should take up this new spraying business. I do not know anything about his orchard. He may have his first crop, and conditions may be entirely different to others and this last year has been an exceedingly fine year for spraying. Most any sort would seem to be effective. I spray sometimes and think results are all right, but at the end of the season, we are undeceived. I believe the key to successful spraying is to get the first crop of insects. The codling moth, for instance, one will get into an apple and be converted into a moth miller that will lay a new crop of eggs and get out in eight days. You think in the fore part of the season your crop is fine and will pan out nicely, but the accumulation of these insects is such that at the close of the season, you find you have a great many of them, when you thought you had only a few. I advocate spraying. I have one illustration in mind that came under my observation last fall. I have an orchard near West Liberty and sprayed three, and part of it, four times. A neighbor had 150 trees which had their first crop. The neighbors looked at his, then at mine and said, "What is the use to spray? He has just as nice apples as you have." They looked just as smooth and nice. The neighbor was offered $100 on the trees. His apples were just as nice as mine and he thought he could get his $100. But when picking time came the worms had gouged his apples to pieces. I remember several times in years past when I did not spray as vigorously as I do now. I have been jubilant over my prospects for a nice crop of apples, and when the time to gather came, I would be astonished to find I had so few number ones. No one need expect to annihilate the codling moth entirely, but I am an advocate of spraying, and we can decrease their number if we get the first crop. There is no first or second crop of codling moth. There is a continuous evolution. You must fight them the entire season. You never can eradicate them. We should learn more and more about spraying. There are a good many things I could say about this matter and could tell a good many of my failures and the many times I have missed it, and more about my failures than about my successes.

MR. VANAUSDAL—Experiments are good, and we should encourage them, and do all we can to encourage experimental stations. Orchard growers can do more to test orchard spraying by trying these different spraying materials and tell others what they have tried and what success they have had. I hope our friends from

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Lawrence county will try it another year and will have it in mind to come here one year from now and tell us what success they have made during the next year. We should encourage men who will take hold of these things.

MR. HONEY—I agree with Mr. Vanausdal. I think it is right to experiment with these things, but what I had reference to was not to abandon the other and take that up which is entirely new.

MR. EMERICK—I shall use 1500 pounds of Pyrox and 1800 of soap for next season. It was to a certain extent an experiment with me, but I had testimonials from people in the east who used it.

MR. JOLLY—Mr. Emerick has had very great success and it may be the proper thing to use, but I think we should be careful in taking up these preparations that are advertised. There are different matters just as strongly advertised as this is. We find them in our horticultural papers, but you take them up to the people that are scientific and know what they are. Let Mr. Emerick try it again. All you people who take the Fruit Grower read of Scalicide which kills all scales over an orchard, and which one of our prominent horticulturists in one of our Western colleges said they had used. They had sprayed it in December and March of last year and in April they put two experts in the orchard, and they worked three days and never found a live scale. That was pretty good. That was just as good as I wanted. I do not want to make a sulphur and lime wash if I can help it. When I saw him again, he sent for me and I went. He said he stood where he did when I talked to you before. Lime and sulphur wash is the thing. The Scalicide is no good. The oil evaporates and runs around the limb until it has covered it, but does not kill the scale. Lime and sulphur stays on for days sometimes and kills the scale by staying there. I have great faith in Forbes and other professors in our Universities. We should make a little experimental station of one place and not try it all over. I do not think it is safe to give up.

MR. VANAUSDAL—These scientific men are all right, I believe. Mr. Jolly thinks they differ in these things. We should learn what we can from them, but what can we learn that will be of more benefit to us than experiments by our own people in their own orchards. Why not experiment a little along these lines. Mr. Emerick has had the grit to go ahead and try them and comes here and tells what success he has had with them. Do not remain in a rut on account of differing with scientific men, but let us pay particular

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attention to those men who go on and try these mixtures and find results from them. I feel like encouraging them to go and find out what is best to use.

O. T. JONES, Sumner—I will say a few words in regard to this Pyrox and whale oil soap. We were trying to find something superior to the Bordeaux mixture to spray with because of the mixing of it. We saw an advertisement of this Pyrox and wrote over the country to four or five different orchardists in different states and got letters direct from orchard growers who had used Pyrox one, two, three and four years. They told us what their success had been in using Pyrox a number of times. I think their apples ran from seventy-five to ninety per cent number ones, so we ordered this Pyrox and whale oil. Mr. Emerick used Pyrox and whale oil soap. We used Pyrox, and I was in Emerick's orchard and also in our own, and I do not know if he did a better job of spraying, but the soap was a benefit, for his apples were better than ours. They were better in one way. You could go into Emerick's orchard and hardly find two apples hanging together, while in our orchard there were in clusters of two, three and four. I think Mr. Emerick's orchard would run from eighty-five to eighty-eight per cent number ones, but ours would run about sixty per cent. Most of you apple men will understand that is a good average. We have ordered Pyrox again and will use soap this time.

MR. NAFFSINGER—My opinion is that Pyrox is not superior to arsenate of lead. Bordeaux mixture is as good as, if not better than, Pyrox.

MR. O. T. JONES—People who have used lime and sulphur in spraying their orchard have had excellent results, not particularly for scale, but for cleaning it.

MR. JONES—Whale oil soap is a good fertilizer.

MR. POFF—I do not know as I can say very much, but I sprayed with the Bordeaux mixture for bitter rot and had great success. I sprayed nine times. On my Willow Twigs I used five pounds of blue stone and seven pounds of lime, and on my Ben Davis I used four pounds of blue stone.

O. T. JONES—I have an orchard with bitter rot and have not been able to control it. Last season I had a prospect for anywhere like 800 to 1,000 barrels of Willow Twigs. They had been sprayed three times. We quit spraying, knowing that the bitter rot was in the orchard. We did not commence soon enough. Up to July 1 the apples were fine looking, but we never got an apple. The last time we sprayed with Bordeaux mixture, Prof. Scott, who

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was experimenting then, said I did not commence soon enough. I should have commenced early in July or possibly last week in June. We have no Jonathan in that orchard. We saved a few of the Ben Davis, but of the Willow Twigs we did not save an apple.

MR. POFF—I commenced spraying in June and continued into August and did not lose two per cent and picked as high as twenty to thirty bushels from one tree.

MR. HONEY—I have 100 Willow Twig trees, and up to last year I have had nothing from them. I sprayed them three times. They brought me gross $3.50 per tree. Very few were rotten. I do not know whether it was a bad year for bitter rot, or whether it was spraying. Sometimes we do not have bitter rot. I had no bitter rot on these 100 trees.

MR. NAFFSINGER—I think our experimental stations claim that spraying for bitter rot is more a preventive than a cure. You must spray before bitter rot manifests itself.

Noon recess.

AFTERNOON SESSION.

MARKETING APPLES.

A. J. DUNLAP—I will state that I only have a few acres of apples in bearing, and this last fall I had a less number that had any good apples on them. I started out with the idea I would get all out of them I could. I commenced with my Jonathans. I had only a few trees but got some very nice apples off the few trees I had and put them in storage and held them until I could get my winter apples, then struck out with them. The second week in November I had everything ready with no expense except one man, and a part of the time I was not able to have one man. We succeeded in getting one carload of very nice apples, and I will state here a thing which I have found out, to get a reputation for apples in a market where they are buying apples, pack them in such a manner that the party who gets them, the next year will want more of them. Two or three days before I was ready to start, I picked out my little town in north-central Illinois, not far from the city of Peoria, one of the biggest apple markets there are. I went up there, right into the fire. First I had some bills printed that I would be there on such a day and the names of apples, etc.

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I reached there; no one had any apples. The only apples they could get were those from the city markets. I sold out my apples in that little town in a day and a half. I reached there with the car November 8. I sold my Ben Davis at $2.25, my Jonathans, Rome Beauty, Akins, at $3.50 at the car door. On the first day I sold 100 barrels. The only drawback with me was that I had too many poor apples. There is the key to the situation. If we can grow the apples the market demands, we can get the market all right. We grow too many poor apples. I could have sold ten or twelve carloads of apples in Peoria county with the little acquaintance I had there.

Put your apples up in shape so you can go right to the family and sell them so they can keep them. You must gain the confidence of the people, and you can get your price. One man in the city of Peoria who bought apples of me said he could not get good apples from the wholesale houses there. Only once in a while he could get a fairly good barrel of apples. You cannot tell from the face what the quality is. You must go there yourself, or have a good representative there in the fall to get next to the people and get their confidence. There is nothing further I can suggest along this line.

MR. LANDENBERGER—I handle apples in many different ways. I think the best plan is to cold storage them. I believe that is the best plan for your market. I find there is great shrinkage in apples in putting them away for the winter. In cold storage, there is scarcely any shrinkage. I wait for the market and find out where I can do the best.

LEE WILSON—If this community could have cold storage for their bulk apples, they could have made 100 per cent profit right here in this county. Apples we bought for less than forty cents per hundred, sold for $1.25 f. o. b. here. In my mind the apple that is going to control the market is the bulk apple. The people who do not put the expense of the barrel on their apples are going to control the markets of the United States. It is the workingman who eats the apples. He buys hundreds where the man who buys high priced apples will buy a peck. In our cold storage we found when we stored in bulk we made a profit, but did not when we stored in barrels. The railroad estimates the barrel of apples at 160 pounds, while the apples in that barrel weigh 120 to 130 pounds, according to how green they are, or if they have been held in storage. The difference in freight would amount to six or seven cents per barrel on any reasonable shipment.

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MR. VANAUSDALE—The carloads of apples they ship along in the fall are the apples they make the money on. I visited the Secretary of Cold Storage Plants in this section and he said they had orders for nineteen carloads of apples to go out this week and have had trouble in getting cars to ship those apples. They would load at different points. I supposed they were making a good profit on apples in cold storage. He said they would be glad to make fifteen cents per barrel. Just to bear out what Mr. Wilson said, he said the apples they shipped out in bulk last fall, 35,000 barrels if they had all been barreled, were the ones they made the money on. The apples in cold storage have not made them the money they expected. You can count on fifty cents per barrel for cold storage. There is the handling, the barrels and some apples will shrink, and altogether we will be glad to get fifteen cents profit on each barrel. I talked to a gentleman in Indiana who raised Wine Sap apples. He said that he would make $1.50 to $3.00 on each barrel, but said they would be glad to make twenty-five to fifty cents per barrel. We find they are going to make very little money on their investments. We cannot conclude that the man who puts his apples in cold storage is making all the money there is to be made in this business.

LEE WILSON—If the grower had access to cold storage and could put his apples in without barreling them, I think there is money to the grower in cold storage. There is a glut during the harvesting of the apples. Then following that glut there is a demand for apples. The price will jump to almost double. If we had a large cold storage here where you need it, where the orchards are, you could store these apples in bulk. You would not have to pick them if they were Ben Davis, you could shake them and put them out right after the glut and make thirty cents clear profit. You would have to have a very large cold storage, but you need it. It will require very much to chill the storage and if properly built, it is almost indestructible. We could control big markets. We want the little man who has to pay cash to get the stuff. Bulk apples keep in cold storage and do not lose one per cent on 650 bushels. We did not get one bushel of specks out of that.

CULTIVATING.

MR. BEEBE—I can tell you how we are cultivating our old orchard. We are doing it with sheep. One year ago we turned in a flock of sheep in our old orchard, and we like the plan very well, so we are going to try it next year. I would not advise it in

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a young orchard, and most people think we are running a great risk in having the trees peeled. We are keeping our orchard clean, and the wind falls are picked up. We are not cultivating the ground very much except in that way.

MR. BYERS—I believe in cultivating and keeping the ground stirred up well with the disc, and I think the result of that will be seen in the fall.

MR. EMERICK—I believe in feeding the trees as well as cultivating them. If I had to make a choice of the three, spraying, cultivating or fertilizing, I would fertilize and spray and leave cultivation out. I cultivate every other year. This year my orchard was in clover. This spring I will put my fertilizer on top and plow under. In August I will sow clover and grass seed. Next year it will be in clover. I turn sod under. I plow just as near the trees as possible. I can get to within four feet of them. It you get any nearer, you will cut the roots. You can harrow both ways and then diagonally across. I plow two and a half to three inches deep. I turn everything under. I have not missed but one crop in six years. When the trees were seven years old I got a pretty good crop. One year the hail prevented a crop.

MR. ZOOK—I do not believe it is in the feeding, but in the soil, that trees in the east live to be fifty or sixty years old. I do not think our orchards will be profitable after twenty-five to thirty years. The feeding is all right. You can spend more money in feeding than you will be likely to get back, but this feeding is the topic before the House now and I want to say a little on it. I have had a good deal of experience in the last seventeen years. I started out to cultivate after the scientific way. It should be thorough and intense, but it will not do in our soil. You will get as good results as if you cultivate one year and then sow in clover, and in our land there is not one acre of good orchard land that will not grow clover. You can grow a great deal of clover and have out a great deal of fertilizing, enough to keep a thorough cultivation. The State says it will cost fifteen dollars, but it will cost eight, nine or ten dollars. In September if you will give two loads of good manure to the acre, and then sow to rye, and in the spring sow clover, you will never fail to get a good stand of clover in just that way and with that manure. It seems a very little amount of manure, of composted manure, but it is equal to eight or ten that goes out of town here. You must understand handling that manure and composting it that you do not burn it up. Sometimes you must use cold water to prevent burning. Then in the spring you have sowed your rye, sow your

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clover and after it is in bloom and the seed formed, mow it down and let it lie, sometimes two and sometimes three years, and you will have good crops of apples. I have my doubts that you can afford to buy the commercial fertilizers to raise apples to sell at forty to eighty cents per barrel, and get out whole. It has been about eight years since I commenced this clover business. I have ten acres prepared and manured now to sow in clover this spring.

MR. ED. S. WILSON—Why should you expect to raise apples without cultivation any more than you would raise corn or any other crop without cultivation? Who expects a fortune in this country or any other without working, is greatly mistaken. The man who lets his orchard go to rack and ruin has no more prospect of a crop than the farmer who lets his farm go to ruin.I have Akin Seedlings fifteen years old, and they have not produced enough to pay for 100 Ben Davis apples. We do not succeed on the Akin Seedlings because we do not study them. It is just as necessary to study your apple trees as to study soil. You must not go down with a plow twelve inches deep to cultivate our apple trees because we have a hard pan. Our apple roots are right on top of the ground, and if you put a plow in, you will cut the roots. Two inches on top of the ground is better than twelve inches of clods and broken up into rough masses.

MR. NAFFZIGGER—Do you do anything besides cultivating and pruning? Do you fertilize?

MR. WILSON—I am talking to you about what you should do. Some of them I wish I had never done. When my trees were young I worked them and spent money on them. It would have been money in my pockets if they had died the year they were set out. We have a pear country here. The soil is hard, firm and close and adapted to pear trees. The less you do to the pear tree, the better it does. The tougher you get the soil, the better. If you had planted pear trees instead of apples, we should all have been rich and not have to work so hard.

PRUNING.

MR. DUNLAP—I have a few Akin apples and up to a year ago I had done nothing at all and had not had any apples off of them. I started in and pruned some of them. You will not miss it by thinning Akins at the top. Those which I thinned bore nice apples this last year. Off of one tree I got as many nice apples as I

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did off of eight or ten I did not thin. I expect those trees will do better another year than this last year. I did not take everything out of the middle but thinned out as I went up to the upper branches and tried to make the top lower instead of letting it get any higher. I think we can get some good apples off the Akins if we prune them right.

MR. HONEY—I am not sure I shall be able to say anything of interest along this line. My experience in the matter of the cultivation and care of orchards dates back to the time I planted my first orchard sixteen years ago last fall. Now it seems to me from the way the apples lay on the ground and rotted last fall, the most interesting topic would not be how to produce more apples, but how to care for the crop so we could get better money off what we had. But we will talk of that now. I shall talk to the end that we may produce more and better apples than we have been producing. I am a believer in pruning. After having sixteen years' experience in the raising of an orchard, I made mistakes and the greatest mistake in regard to pruning is that we do not prune enough in the early life of the orchard. A good many years ago I was here at a horticultural meeting and several of us took a trip out to look at an orchard. Some one of us had out his knife and cut off a limb and was told that there would now be two limbs where before there was only one. It is true in a young orchard, but I think it a great mistake. In the early pruning of my orchard, I would look at a limb and leave it if I could find any excuse. I wanted more apples. But now if I were raising another orchard I would adopt an entirely different rule for the first twelve years at least in the pruning of that orchard, and it would be something like this. Instead of hunting for an excuse to leave a limb, I should hunt for one to take it off. Now I will tell you why. Take especially the lower limbs. I know it is said the lower limbs produce the most apples, but while it may not be in the way now, it will be in a short time, and less injury is done during the first twelve years than later. It is not necessary to start the head high. Prune the prongs. Prune them so they will stand upright. While I have not lived in my orchard all the time, I am staying there now and have visited it every week of the summer and often during the winter, and this is my observation. We must trim and trim vigorously for the first ten or twelve years. There is a reason for this. In the first place the light and sun should be let in for the especial purpose of giving color to the fruit, to get larger fruit and to complete spraying. No man can spray a tree thoroughly that has a labyrinthian foliage. There is an advantage in the tree being kept low. The apples will be large, nice and better colored and better in every way. I am working to

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this end, and am sorry to say that I am now taking off large limbs that perhaps may injure the tree, which should have been taken off years ago.

What are you going to prune with?

I have two tools, a Buckeye Pruner and a good saw. I use a Diston hand saw about twenty-eight inches long, and have it sharpened often. I have several of them and have hands to help and so it takes a great deal of sharpening. I also use a short ladder with three or four rounds, so I can stand in the fork. You can reach out and prune from the center, and when the limbs are larger, you can step out on them. This is all I have to say on the question of pruning. It is one of the most important things in the care of an orchard.

QUESTION—Do you paint the scars?

I used to paint the scars on the apple tree, but do not any more. If you do not paint them they dry thoroughly. If you saw off a limb from a tree, and there is a loss of sap oozing out, you cover it up so it cannot evaporate and will set up a fermentation. This is my observation. There is very little danger in removing a limb during the first ten years. The scars heal up quickly. Once in a while you take off a limb and there will be a bleeding right at once. That tree is already defective. The liability of damage is greater the larger the limb. An old tree will not heal as quickly as a young tree. You must prune trees according to their habits. My choice is in June, but in a big orchard, you must trim when you can, except when the tree is frozen. I have pruned at all times of the year.

MR. JOLLY—We raise too many number two apples. We should learn to raise less wood. We do not want them any larger after they are fifteen or sixteen years old. Horticulturists should learn to produce a fruit growth, not a wood growth.

MR. ZOOK—June pruning will heal better than any other. There will be less water sprouts than at any other time.

SAN JOSE SCALE.

MR. WILSON—About one year ago a gentleman came to my house and said: "Do you know you have San Jose scale in your orchard? I have been through your orchard today, and you have a great deal of scale." I asked him upon what authority he had been examining my orchard, and he said he was from the University. He pointed out to me the limits of the San Jose scale in my orchard. I sprayed for it within those limits, and this year it

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did not show any in my fruit. Outside those limits, the effect of the scale could be seen on the fruit. I have written to parties about what remedies to use. Several things were suggested. Prof. ———— used kerosene. Green's Fruit Grower had not used kerosene. Another firm sent me their literature, and I wrote Prof. Forbes about these things. His assistant wrote me they had settled it East as far as the University was concerned, that the best thing was sulphur and lime. I used that, and it was effective. The first time I mixed it, I put the lime in the water to slack. I would save that much time and heat, causing the lime to heat the water, and when I put the sulphur in it would get to boiling sooner. That particular boilerful got lumpy and would not strain well, so I threw it away. The next time, I put all in together, lime, sulphur and water and heated them together. It did better, but it is hard to make it spray through the nozzle. Mr. Jolly says it is necessary to keep it hot. I do not know how you can keep the water hot after you get it into the tank. I mixed mine in a zinc tank and boiled it for an hour and a half. I made up my mind from the confidence I have in our State authorities that the only way to fight the scale is with sulphur and lime. I do not believe in any of the patent things.

I am going to fight San Jose scale by taking the authority of Illinois. Illinois has the reputation of having the best authorities and the most efficient experiment stations in the United States. I do not know how bad San Jose scale can become in this country, but I do not believe it will ever be as bad here as in California and other countries. It is one of the new things we have to fight. We had enough to fight before. We began as soon as the frost was out of the ground on the curculio and the codling moth and other enemies we had to fight. This is a step earlier in the season. The entire cycle of the year is used up in your orchard, and a man with an orchard has no business for anything else on his farm. I know nothing about San Jose scale. I know that sulphur and lime killed the scale as far as I sprayed with it last year, and this year I am going to spray my entire orchard and keep on until the buds get so large I cannot spray any longer. I am going to begin as soon as I can and keep on as long as I can. The scale cannot crawl and cannot move, yet he will start in one end of the orchard and in two years travel the length of it. It was explained to me that a scale gets on a bird's foot and is carried over the country.

The officers elected are:

PRESIDENT.....J. F. JOLLY, Olney
VICE PRESIDENT.....J. L. ZOOK, Olney
TREASURER.....F. LANDENBERGER, JR., Olney
SECRETARY.....LEE WILSON, Olney

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ROCK RIVER HORTICULTURAL SOCIETY.

OFFICERS FOR 1908.

PRESIDENT.....AUSTIN POWERS, Sterling

VICE PRESIDENT.....MRS. ANSON THUMMEL, Dixon

SECRETARY AND TREASURER.....MRS. EMMA HEY, Dixon

This Society held three meetings in 1907, as usual.

SPRING MEETING.

The first meeting of the year was held March 19 at the home of Mr. and Mrs. Warren Powers, Sterling.

Our Society at the present time is made up of forty families and meets at the homes of its members. At the last meeting of the previous year a motion was made and carried to the effect that in future only members' families and their guests should be invited to the meetings. The attendance at the Powers home showed the wisdom of this step. The house is commodious but was filled to overflowing.

Our meetings are always an all-day affair with a basket dinner and an afternoon program, at which we have music, recitations and horticultural talks. At this meeting we were especially favored, having three very excellent talks. Mr. C. H. Burkholder, of Sterling, gave a very interesting and instructive talk on grape growing for the home. Mr. Robin Hartwell gave a very practical talk on spraying, and Mrs. Nora Dunlap's address on "The Duty of Having Good Health," was very much enjoyed by all.

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JUNE MEETING.

The June meeting was held at the home of Mr. and Mrs. Albion Seavey. The home of the Seaveys is an ideal farm home, much attention having been paid to its adornment with flowers, shrubs and shade trees.

At this meeting J. L. Hartwell exhibited fifteen varieties of strawberries grown by him at the experiment station here.

Mr. W. R. Soverhill, Tiskilwa, gave an instructive talk on the profitableness of thinning fruit, giving methods of doing the work and figures on its cost and profitableness.

SEPTEMBER MEETING.

The September meeting was held at the home of Mr. and Mrs. Chas. Hey. We were nicely entertained by a paper by Miss Harriet Buffett on "Our Neighbors, the Birds."

Rev. J. F. Newton addressed us on the topic, "Moral Value of the Beautiful in Nature."

A communication from Mr. H. R. Cotta on landscape work was read.

The following officers were elected:

President—Austin Powers.

Vice-President—Mrs. Anson Thummel.

Secretary and Treasurer—Mrs. Emma Hey.

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KANKAKEE VALLEY HORTICULTURAL SOCIETY.

OFFICERS FOR 1908.

PRESIDENT.....M. A. POTTENGER, Waldron

FIRST VICE PRESIDENT.....S. DEVERE

SECOND VICE PRESIDENT.....N. A. BRATTON

SECRETARY.....ALDEN SNYDER, R. F. D. 2, Kankakee

TREASURER.....MRS. M. J. BARNARD, Manteno

Executive Committee—F. A. Baldwin, Kankakee; N. M. Richmond, Fred Cooper, S. Saltzgiver and Mrs. B. L. Cooper.

The above named officers were elected at the annual meeting held in December, 1907.

JUNE MEETING.

The June meeting of the Kankakee Valley Horticultural Society was held at the Fair Grounds.

The weather was warm and pleasant. Owing to the late and busy season the attendance was not as large as usual. Over fifty partook of a dinner that satisfied the appetites, although it was the first time in the history of the Society that strawberries were served at the June meeting.

At 2 p. m. President Devere called the meeting to order.

D. N. SNYDER—Reported that half of his raspberries were killed and other fruits badly damaged; very few peaches.

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WM. COOPER—No cherries; not many strawberries; grapes promise well.

MRS. BARNARD—Reported flowers about the same as usual; roses that stood other winters were killed last winter.

MRS. W. S. SHREFFLER—Do not raise many flowers, and I notice many others do the same. Passed by the residence of a certain bachelor who raises some nice flowers and berries; think if he had a family to look after he could not spend so much time with his flowers.

F. A. BALDWIN—Sent for some strawberry plants which were very highly recommended. When they arrived there were only three plants. A card from the growers said those plants are worth a dollar a piece, but I gave you two. They are called the "W. W.," and have been known to produce 100 plants from one plant.

The following program was rendered: Recitation, Johnnie Booth; song, Charlotte Haak; recitation, Martha Devere; song, Naomi Robinson; recitation, Ruby Robinson; recitation, Mabel Smith.

There were but two exhibits of roses and but one of strawberries. As there was no competition the awarding committee thought best not to award any premuims.

On motion of C. E. Robinson, the Society was requested to secure a speaker from the State University for our next meeting.

Adjourned to meet in Limestone August 27.

AUGUST MEETING.

The August meeting was held pursuant to adjournment on Saturday, August 27, on the lawn of the Bratton home in Limestone. About seventy-five sat down to the long tables on the lawn for a splendid dinner. The following was the program: After singing of "America" by the audience, Rev. J. F. Robinson made a prayer. Then followed a reading by Miss Jessie Armour and a solo by Miss Katie Goodknecht.

Eulogistic resolutions for the late O. W. Barnard were passed. He was a valued member of the Society, and one of its charter members.

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Reports on fruit from P. W. Benedict and D. N. Snyder indicate no pears or plums, very few peaches and apples, some quinces and plenty of grapes. Prospects for small fruit for next year are good. Mr. Snyder has an acre of small fruit and prunes nearly all summer.

Miss Jennie Cooper reported a blight of roses and wanted a remedy.

Charles Robinson exhibited fine potatoes of the Early Rose and Rural New Yorker raised by Mr. Wakeman. Early potatoes were blighted probably by hot sun. Mr. Bratton thought some put on too much Paris green.

Dave Snyder exhibited Evergreen blackberries. Considered them the best grown; they bore nearly all summer.

All members were urged to bring something to the fair to help the Horticultural Society's exhibit.

A vote of thanks was extended to the Bratton family and others for making the meeting a success.

Adjourned to meet at Chebanse September 28.

SEPTEMBER MEETING.

The September meeting was held at the residence of C. E. Robinson in Chebanse September 28. On account of the disagreeable weather the attendance was very small. A picnic dinner was served in the house. Miss Edna Newman, of Kankakee, gave a reading. Prof. John W. Lloyd, of the State University, gave a very interesting and instructive talk on pruning and caring for small fruits. G. H. Gray exhibited some very fine samples of corn, carrots, potatoes, etc. Mrs. Miner exhibited some beans. F. A. Baldwin exhibited an apple of the Beitemheimer variety weighing eighteen ounces, brought from Everson, Washington, by Dr. O. E. Beebe.

Adjourned to meet in Kankakee December 21.

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SPRINGFIELD HORTICULTURAL SOCIETY.

OFFICERS.

PREISDENT.....H. P. HART, Roby
VICE PRESIDENT.....LOUIS SMITH, Springfield
SECRETARY-TREASURER.....H. EMERSON PHELPS, Springfield

Meetings 2nd Saturday in Feb., May, Aug. and Nov.

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OFFICERS.

PRESIDENT.....F. I. BIZAILLION, Hardin
VICE PRESIDENT.....A. C. MOTTAZ, Hardin
SECRETARY-TREASURER.....G. L. ADERTON, Hardin

EFFINGHAM COUNTY HORTICULTURAL SOCIETY.

OFFICERS.

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VICE PRESIDENT.....H. N. RUFFNER, Mason
SECRETARY-TREASURER.....G. F. TAYLOR, Effingham

Executive Committee—Wm. Dyke, H. N. Ruffner, G. F. Taylor, A. D. McCallum, Edward Austin.

CRAWFORD COUNTY FRUIT GROWERS' ASSOCIATION.

OFFICERS.

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VICE PRESIDENT.....JOHN D. TRIMBLE, Trimble
TREASURER.....ENOCH E. NEWLIN, Robinson
SECRETARY.....GEORGE N. PARKER, Robinson

WABASH COUNTY HORTICULTURAL SOCIETY.

OFFICERS.

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VICE PRESIDENT.....WM. A. ANDREWS, Linn
SECRETARY-TREASURER.....HALLOCK SHEARER, Gard's Point

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WILL COUNTY HORTICULTURAL SOCIETY.

OFFICERS.

PRESIDENT.....C. E. FINLEY, Joliet
VICE PRESIDENT.....T. C. SHEPHERD, Sr.
SECRETARY.....WM. A. BALDWIN, Joliet
TREASURER.....T. C. SHEPHERD, Jr.

This Society was organized January 26, 1906, with twenty-five charter members. The dues are $1.00 a year and the annual meeting is the last Saturday in January. Meetings are held monthly, except during the warm weather.

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